

# FLIGHT

The  
AIRCRAFT ENGINEER  
AND AIRSHIPS

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## INDEX FOR VOL. XXII

The 8-page Index (over 6,800 references, plus "Aircraft Engineer" 220 references) for Vol. XXII of "Flight" (January to December, 1930), is now ready and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C.2, price 1s. per copy, net, (1s. 1d. post free).

## EDITORIAL COMMENT



DESPITE the growth of air-mindedness, there are still many people who do not realise the facts and conditions which govern the business of air transport. A good deal is published about the delights of those who like travelling by air, and of the terrors of those who either do not like it or have no intention of sampling it. One hears also a good deal about the disgust of the correspondent who posted his letter the day after the air mail left for India, and is surprised that it took so long to arrive. But of air transport as a business far too little is heard.

### The Business of Air Transport

This long-felt want, as the saying goes, has been satisfied to a great extent by the paper read before the Marshall Society of Cambridge by Sir Eric Geddes, G.C.B., etc., Chairman of Imperial Airways. Substantial extracts from this admirable paper are published in another part of this issue of FLIGHT. As an analytical summary of the subject, it is about the best compilation ever made. It deserves to be very widely read and studied.

It is our practice when something more than ordinarily good comes before our notice, to start by casting a critical eye upon it and searching for holes. We could hardly expect, for instance, to find the Chairman of Imperial Airways decrying the system of subsidies, and clamouring for their reduction or abolition. We are not surprised to find that he considers them to be still very necessary. But we can find no flaw in his argument, and we very much like the epigram in which he sums up his case. "Subsidies are paid to accelerate progress, to bring to pass in 10 years or so what might otherwise take

## DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1931	
Feb. 17	London Aeroplane Club Dinner and Dance, Park Lane Hotel.
Feb. 19	"Heat Treatment of Steels," Lecture by A. L. Williams, before R.Ae.S. (Glos. and Chelt.)
Feb. 19	"Layout and Equipping of Service Aircraft," Lecture, by Sqdn.-Ldr. R. S. Sorley, before Westland Aircraft Soc.
Feb. 21	Rugby Football R.A.F. v. Navy at Twickenham.
Feb. 25	"Land and Air Defence Forces of Australia," R.U.S.I. Lecture, by Maj.-Gen. J. H. Bruche, 3 p.m.
Feb. 26	"Meteorological Aspects of Gliding and Soaring," Lecture, by Capt. F. Entwistle, before R.Ae.S. and B.G.A.
Feb. 26	"Latest Aircraft Instrument Developments," Lecture, by Maj. C. J. Stewart, before Westland Aircraft Soc.
Feb. 26	"Motor Fuels and Modern Methods of Testing," Lecture, by Anglo American Oil Co., Ltd., before R.Ae.S. (Glos. and Chelt.)
Feb. 27	"Aircraft Light Alloys," Lecture, by H. Sutton, before R.Ae.S., Hull.
Feb. 27	British Gliding Association Annual General Meeting.
Mar. 4	"Meteorology and Air Navigation," R.U.S.I. Lecture, by Lt.-Comdr. J. W. Josselyn, 3 p.m.
Mar. 5	"Mechanical Testing of Aircraft Materials," Lecture, by L. W. Nethercott, before R.Ae.S. (Glos. and Chelt.)
Mar. 7	Sailplane Club and Model Aircraft Club Joint Dance at Suffolk Galleries
Mar. 12	"Metals," Lecture, by W. J. Norton, before Westland Aircraft Soc.
Mar. 14	Opening of British Empire Trade Exhibition, Buenos Aires.
Mar. 14	Association Football: R.A.F. v. Army.
Mar. 19	"Research in the Berlin Technische Hochschule," Lecture, by Dr. W. Hoff, before R.Ae.S.

100 years or more to develop. Subsidies are a medium through which we can buy the future."

We cannot, however, go the whole way with Sir Eric Geddes in his remarks about the consequences of using multi-engined aircraft. He speaks of the "real ability (of the three-engined machines) to keep flying in spite of an engine failure." This is true enough so long as the machine is not loaded so heavily as to require all three engines to keep it in the air. The mere possession of three engines does not in all circumstances give immunity from forced landings. But a little later on Sir Eric assumes that it does do so. He says, "The immunity from forced landing of the modern multi-engined aircraft is such as to permit of some increase in stalling speed, and at the same time to carry a greater total load in relation to the horse-power provided." It is just this increase of load which tends to rob the machine of its immunity from forced landings, and Sir Eric's claim cannot be admitted. A really air-minded public will not be lulled into security by a statement that a machine is multi-engined. It will ask if one engine is actually superfluous to the power required to carry the load on that machine.

One other remark of Sir Eric Geddes calls for some comment. He says, "I believe that the worst possible harm to flying would be done by scheduling an air service to run regularly over a long-distance route such as England to India to the high-speed time table followed by some of those who have made the splendid pioneer—but isolated—flights on the route." So far as passenger services go, we quite agree. But we do believe that special mail services should be able to travel at about 150 m.p.h. by day, and, as soon as possible, by night. The speed of flights like Hinkler's and Kingsford-Smith's has pointed out how very much more speedily mails could be transported than they actually are.

Having done with captious criticism, we can give the highest praise to the way in which Sir Eric Geddes summarised his subject, and showed how intertwined are the commercial and the technical sides of the problem. He showed how British practice in adhering to a low stalling speed has apparently retarded progress in performance. When the better performance of foreign machines is quoted, it should be remembered that on the continent of Europe and in the United States very much higher stalling speeds have been permitted than would be passed in Great Britain. World statistics of accidents are not available, but Sir Eric was doubtless right in claiming that the aircraft with moderate stalling speed has generally been more immune from accidents. The advent of the multi-engined machine will permit higher stalling speeds with consequent better performance, and one result of this may be an increased popularity of the monoplane. At the same time it was pointed out that a certain amount of aerodynamic progress was, so to speak, eaten up by the natural and proper demand for increased comfort. If passengers would still be content with the 20-30 cubic feet of air space a head with which the earlier travellers by air had to be satisfied, the improvement of the machine in aerodynamic efficiency would have been represented by some increase in speed. Now each passenger gets 50 cubic feet or more of air space ;

and if the machine were not actually more efficient, this would have to be paid for by slower cruising speed. The fact that cruising speeds have not sunk, but have remained more or less constant so far as British practice is concerned, is a testimony to the skill of our designers. It is also an instance of how the designer is never allowed to produce his absolute best, but is always bound by the necessity to compromise.

A valuable table shows the lines along which progress has moved in the last nine years. Four machines used, or to be used, by Imperial Airways, are taken for comparison, the D.H.34 and the Handley Page W.8.B., both introduced in 1922, the Argosy of 1926, and the Handley Page 42, which is to be introduced in the present year. The figures for the last are estimated. We make the following extracts from the table :—

	D.H.34	W.8.B.	Argosy	H.P.42
Stalling speed ..	61	52	54	53
Cruising speed ..	95	85	90	105
Pay load (lb.) ..	1,100	2,300	3,500	7,750
Pay load per h.p. ..	2.4	3.2	3.1	3.4
Number of passengers ..	6	12	18	38

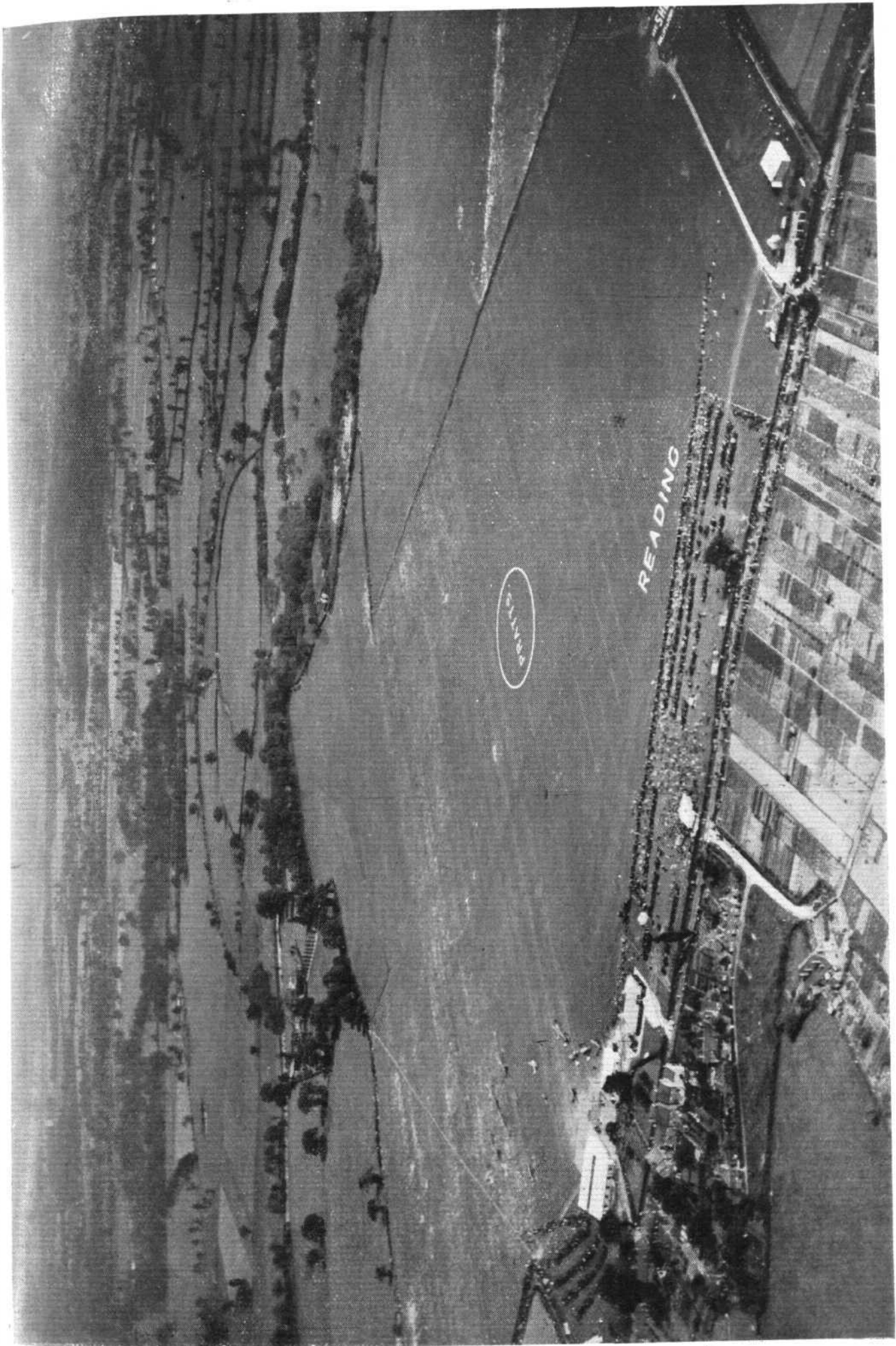
These figures give a very good idea of the line of progress. Cruising speed has only advanced very slightly. Stalling speed has remained very moderate in the multi-engined machines. Pay load per h.p. does not show a very startling increase. But the gross pay load, the safety of the machine, and the comfort of the passengers, all have been very greatly increased. Certainly those are the lines upon which air transport ought to be built up. Goodwill among the travelling public is more important than any spectacular speed of travel which is accompanied by less safety and less regularity.

It might, in fact, be accepted as a cardinal principle that while air transport is fighting for its place in the sun, speed of passenger travel is the least consideration. Mails, on the other hand, ought to go as fast as is possible. Air travel is most worth while over really long distances—the greater the distance, the greater the value ; or at least it will be so when night flying becomes general. In such circumstances aircraft are bound to outstrip ground communications, and therefore an increase of speed through the air is the last goal at which designers and operators need to aim. Reliability and regularity, on the other hand, are primary considerations, and comfort is also of the greatest importance. The successful air lines in Australia and in Colombia are standing examples of these principles. It is to be remembered that the Post Offices of all British countries, when considering air mails, have always put reliability as the first of their requirements ; though in recalling that fact we still hold that in special mail aeroplanes reliability of over 99 per cent. could be, and ought to be, combined with a journey speed of about 150 m.p.h.

Sir Eric worked out the cost of air travel to a passenger on the basis of the charge for every hour of time saved. Taking six of the longest regular air routes, he found that a passenger pays on the average 5s. 7d. for each hour of time saved. On the London-Delhi service the saving in time is 10 days, and the charge per hour saved is only 3s. 10d. That is surely very good value for money.







"BERBUXON": An aerial view of Reading Aerodrome—the home of the Berks, Bucks and Oxon Aero Club. The Club buildings are seen on the left, and on the right is the Phillips and Powis Flying School. (FLIGHT Photo.)



FRONT VIEW OF FOKKER F.XII: The Pratt & Whitney "Wasps" are neatly arranged. (Flight Photo.)

## THE FOKKER F.XII

### 3 Pratt & Whitney "Wasp" Engines

ONE of the most progressive air lines in Europe is the Dutch K.L.M. and K.N.I.L.M., the former being the service operating from Holland to various countries in

Europe, and the latter operating the Holland-East Indies route and the local services in the Dutch East Indies. The Dutch company has an excellent record for safety and reliability, and this has not been obtained by a policy of conservatism and timidity, but rather by one based upon the old saying: "First make quite sure you are right, and then go ahead and see if you are." The K.L.M. has never hesitated to adopt new types of aircraft as and when they became available, but not before there were very good prospects of such machines fulfilling the demands of the moment.

It is by no means easy to choose aircraft for a route, and more particularly for a new route. Upon the correct choice a very great deal depends. If too large a machine is chosen, and the traffic does not come up to expectations, a financial loss is likely to be sustained. If, on the other hand, too small a type is chosen, traffic has to be turned away, with the result that potential users of the line suffer disappointment. If a machine with too low cruising speed is selected, there is always the possibility that weather conditions on a new route may cause frequent delays, which in turn will cause dissatisfaction to the users of the line. But on the other hand, by choosing a type with high performance and a great reserve of power, the pay load that can be carried is reduced in proportion to the power expended, and the ideal of commercial aviation "flying by itself" again recedes into the distance instead of coming nearer.

The choice of machine for the new air route which the K.N.I.L.M. is to operate this summer between Holland and the Dutch East Indies must have been particularly difficult,

as we understand that it was desired to use the same type of aircraft on all the stages. As these stages include widely varying types of country, not to mention the crossing of considerable stretches of sea, it is obviously necessary to have a type of machine which is quite definitely able to fly on any two of its three engines under any variations of air density encountered, and that without, in most cases, having to run the two engines at full throttle for any length of time. One may be certain that it was not until after going into the subject very carefully that the company decided, for a start at any rate, to adopt the Fokker F.XII for the Holland-East Indies service.

One of these machines paid a visit to Croydon last week, and was kept busy during the afternoon taking up passengers who had been invited to attend the demonstration. By the kindness of Captain Leverton, K.L.M.'s London Manager, we were able to inspect the new Fokker F.XII at Croydon, as well as noting its behaviour in the air. The following notes on the machine are based upon material gathered during that visit.

In general conception and design, the F.XII does not differ materially from previous Fokker types. It is a three-engined cantilever monoplane of typical Fokker construction, with welded steel tube fuselage and all-wood monoplane wing.

Bearing in mind that for a route to the East the ability of a three-engined machine to fly on two engines is one of the first considerations, one

#### THE FOKKER F.XII

##### 3 Pratt and Whitney "Wasp" Engines

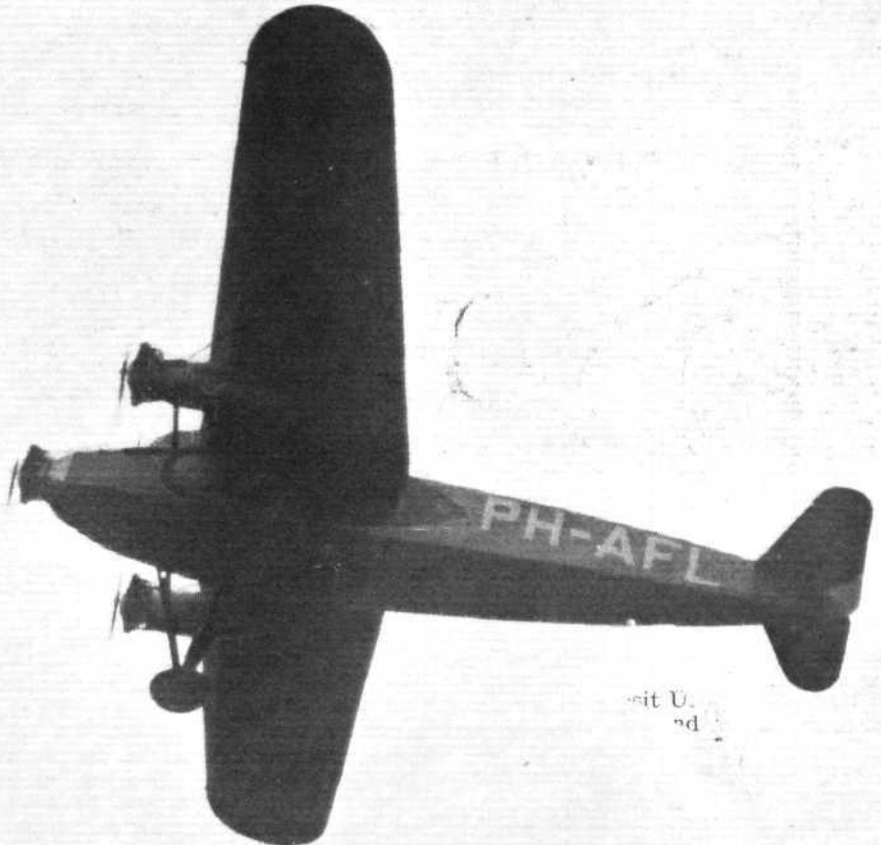
Dimensions			
Length o.a.	..	..	57 ft. 5 in.
Wing span	..	..	75 " 5 "
Height	..	..	14 " 1 "
Wheel track	..	..	20 " 8 "
Length of cabin	..	..	16 " 0 "
Width of cabin	..	..	6 " 7 "
Height of cabin	..	..	6 " 3 "
Total wing area	..	..	893 sq. ft.
Capacity of cabin	..	..	653 cu. ft.
Capacity of lavatory	..	..	57 "
Capacity of main luggage hold	..	..	74 "
Capacity of forward luggage hold	..	..	102 "
Power Plant			
Engines	..	..	3 "Wasps," 425 h.p. each
Maximum revs.	..	..	1,900 r.p.m.
Maximum power	..	..	3 x 425, 1,275 b.h.p.
Revs. at cruising speed	..	..	1,650 r.p.m.
Power at cruising speed	..	..	3 x 285, 855 b.h.p.
Fuel consumption, max.	..	..	3 x 233 lb., 699 lb./hr.
Fuel consumption, cruising	..	..	3 x 156 lb., 468 lb./hr.
Weights			
Tare weight (without equipment)	..	..	9,591 lb.
Disposable load	..	..	6,395 "
Max. permissible gross weight	..	..	15,986 "
Ratio gross weight/tare weight (equipped)	..	..	1.563
Cabin equipment and wireless	..	..	639 lb.
The disposable load may be made up as follows:—			
Crew	..	..	353 lb.
Fuel and oil for 400 miles	..	..	1,830 "
Pay load	..	..	3,573 "
Wing loading	..	..	17.8 lb./sq. ft.
Power loading	..	..	12.5 lb./h.p.
Performance			
Maximum speed	..	..	137 m.p.h.
Cruising speed	..	..	118 "
Minimum speed	..	..	68 "
Climb to 3,280 ft.	..	..	In 6 min.
Climb to 6,560 ft.	..	..	In 14.5 min.
Climb to 9,840 ft.	..	..	In 28.5 min.
Absolute ceiling (14,112 lb.)	..	..	16,728 ft.
Service ceiling (14,112 lb.)	..	..	14,760 "
Absolute ceiling (15,986 lb.)	..	..	13,120 "
Service ceiling (15,986 lb.)	..	..	11,152 "
Absolute ceiling on 2 engines (14,112 lb.)	..	..	6,888 "
Absolute ceiling on 2 engines (15,986 lb.)	..	..	2,952 "
Range (normal quantity of fuel)	..	..	400 miles.
Range with full tanks	..	..	790 "



naturally turns first of all to the loading figures. It is found that these are: wing loading, 17.8 lb./sq. ft., and power loading 12.5 lb./h.p. The first thing that impresses one is that the wing loading is high, and that the resulting landing speed is given as 68 m.p.h. This is, according to British ideas, a fairly fast landing speed, but as Sir Eric Geddes said in his lecture to the Marshall Society of Cambridge, the less is the likelihood of forced landings away from a prepared aerodrome, the greater is probably the landing speed that can be tolerated. And from the fact that the absolute ceiling on two engines and at 16,000 lb. gross weight is given as 3,000 ft. (presumably in standard European atmosphere), it seems likely that the machine will, at more normal gross weights, be well able to maintain its height. One may assume that, with good inspection and maintenance, a sudden engine stoppage is not likely to occur during the first part of a flight (or, if it does, it will probably take place during the first half-hour or so, when the machine would be able to return to its starting point), and that the number of cases will thus be few when the machine is compelled to fly for long at this maximum gross weight on two engines.

Engine reliability should be good in the F.XII. To begin with, the Pratt & Whitney "Wasps" have an excellent name for reliability, and an examination of the data reveals the fact that at cruising speed the engines are developing but 285 h.p., or 67 per cent. of their maximum output. At this power the reliability should be very good indeed. As, according to the data supplied by the Fokker Company, the machine absorbs 855 h.p. at cruising speed, it will evidently be necessary to run the remaining two engines at full power when the gross weight is the maximum permitted. If, on the other hand, the gross weight is something less (as it most likely will be on most flights), it should be possible to cruise on two engines with a little power reserve in hand.

The next point which suggests itself is the examination of the sort of pay load which a machine with this power reserve will carry. For a normal fuel supply the range is given as 400 miles (although with full tanks this is increased to 790 miles) and for that range the pay load is, after making allowance for crew, cabin equipment and wireless, 3,573 lb., or 2.8 lb./h.p. In his paper Sir Eric Geddes gave pay load figures for certain British machines, and 3-3½ lb./h.p. appeared a good figure. This, however, was at a common range of 300 miles. If one reduced fuel for the F.XII to 300 miles, the pay load increases to some 4,000 lb., or 3.16 lb./h.p. So that the



The Fokker F.XII taking up passengers at Croydon. (FLIGHT Photo.)

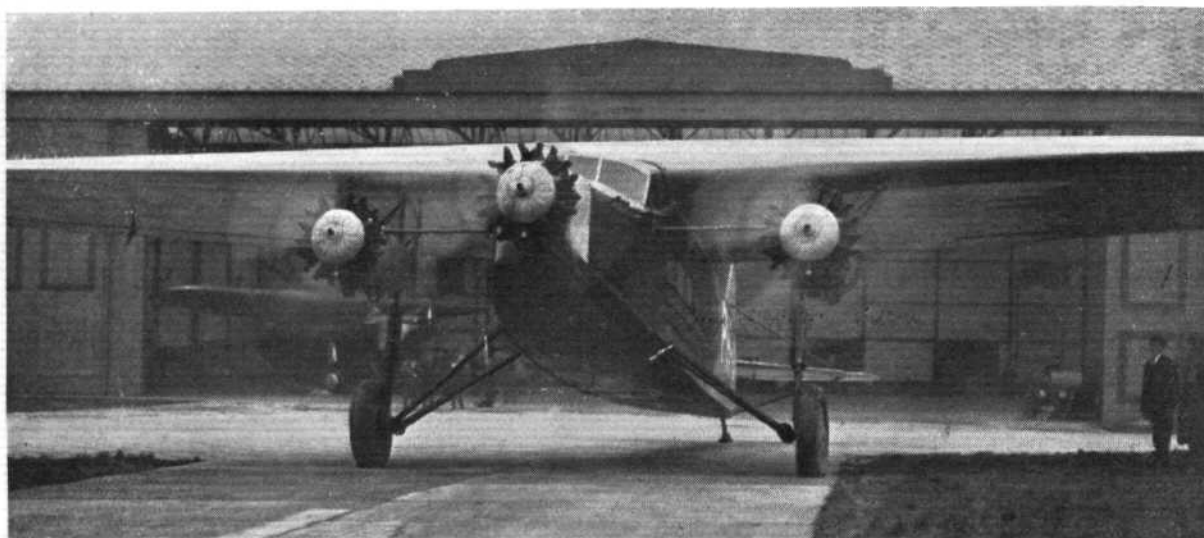
Fokker, in spite of its good power reserve and high cruising speed, is not markedly inferior in the matter of pay load.

As demonstrated at Croydon the Fokker F.XII had seating accommodation for 16 passengers, while there is provision for a crew of 2, with dual control. As in all Fokker machines, the cabin is very comfortable, and not unduly noisy, while the view, owing to the high-wing arrangement, is very good outwards and downwards. The cabin has a capacity of 653 cub. ft., which, for 16 passengers, works out at nearly 41 cub. ft. per passenger. The seats are arranged two at the front of the cabin, two at the back, and four rows of three in between, two in each row being on the starboard side and one on the port. The cabin windows are of safety glass, and are raised and lowered by crank handles. Behind the cabin is, on the port side, the lavatory, and the aft luggage hold is to starboard. There is a separate door to the luggage hold on the starboard side. In the nose, partly under the pilots' cockpit, is another and larger luggage hold.

The pilots' cockpit is totally enclosed, with large windows, which can be opened when desired. The seats are placed



THE FOKKER F.XII: Side view. Note the length of fuselage in proportion to wing chord. (FLIGHT Photo.)



THE NEW FOKKER F.XII : Taxying out for a Demonstration flight at Croydon. (Flight Photo.)

side by side, and dual control is provided. The view from the cockpit is good, although the placing of the outboard engines well ahead of the leading edge results in cutting off the view a little laterally, except for the small gap between the nacelle and the wing. The cockpit is well equipped with instruments, and these are conveniently placed. Communication with the cabin is through a door in the front wall of the cabin.

The engine installation is the usual Fokker type, with the outboard engines pressed well forward and supported on a semi-cantilever structure of steel tubes. Attachment to the wing is very simple, and it should be possible to change an engine very quickly. The exhaust collectors of the outboard engines run along the outer side, farthest away from the cabin, while that of the nose engine runs under the fuselage and provides heating for the cabin. The petrol is carried in three tanks in the wing, each with a capacity of 147.5 gallons. The middle tank is placed above the fuselage.

A wide-track undercarriage of usual Fokker design is fitted. This makes use of the now well-known arrangement of rubber rings stretched over stubs in the two fixed branches of the fork, with stubs on the third, central member bearing against the middle of the rings. The undercarriage has stood up to the test of time, and renewal of the rings is simple and cheap, but it might be thought that even Fokker would have sooner or later to incorporate oleo legs in his undercarriages. It must be admitted, however, that "bouncing" appears much less pronounced than is usually found in rubber-ring-sprung undercarriages.

A feature of all Fokker machines which has been retained in the F.XII is the very long fuselage. If one looks at the side view it is seen that the distance from main wing trailing edge to tailplane leading edge is about two chord lengths or more. We are quite sure this feature is largely responsible for the nice handling of the Fokker machines. The old Avro 504 had a similar, or even greater distance.



## DEATH OF AIR COMMODORE C. R. SAMSON

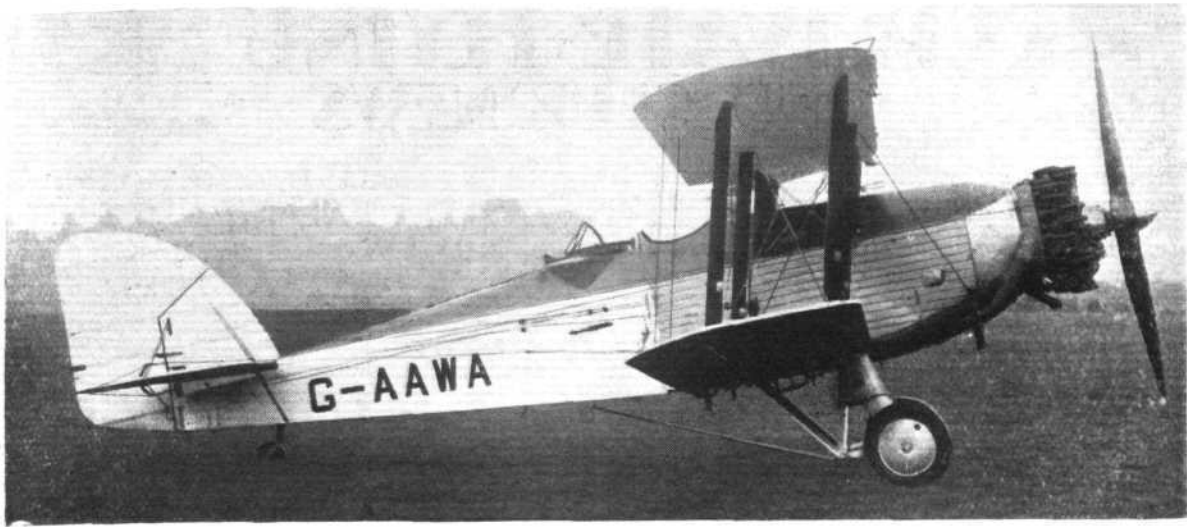
WE regret to record the sudden death, on February 5, at Salisbury, of Air Commodore C. R. Samson, C.M.G., D.S.O. (and Bar), A.F.C., at the age of 47.

Air Commodore Samson was a picturesque figure, who captured the popular imagination, chiefly because of his wholehearted love of fighting and adventure. He was born in Manchester in 1883 and, in due course, entered the Royal Navy. Very early in his career he gained his first medal for the Somaliland operations of 1903-4. In 1911 Mr. (now Sir Francis) McClean offered to provide facilities for teaching naval officers to fly at his private aerodrome of Eastchurch. The Admiralty selected four R.N. and R.M. officers, of whom Samson was one. Shortly after learning, he put up a British duration record of 4 hours 58 minutes. In January, 1912, he made a flight off the deck of the battleship *Africa* in a Short biplane. A similar flight had been made before off an American warship, but Samson's was the first of the kind in Europe. Later he and Lieut. Malone made the first flights from the deck of a ship under way, from H.M.S. *Hibernia*.

Samson was commanding the R.N.A.S. station of Eastchurch when the war broke out, and he flew his squadron across to



France towards the end of August, 1914. There he improvised an armoured car unit, and during the Allied retreat from Mons to the Marne he co-operated with some scratch French forces in harassing the flank of the advancing Germans. His skirmishes with Uhlans and German cyclists were cheery little affairs, and are vividly described in his book "Fights and Flights." Then he took his squadron to Tenedos to spot for the guns of the fleet in the Gallipoli campaign. He and his pilots took all sorts of risks with very unreliable engines, and escaped with very small casualties. Again, Samson's love of adventure seemed to be his chief inspiration. His next rôle was the command of seaplane carriers, the *Ben my Chree* (which was sunk by Turkish gunfire in the harbour of Castellorizo) and *Raven II*. After the war Samson transferred from the Navy to the Royal Air Force, but always continued to wear his naval beard. In 1927 he commanded the R.A.F. flight, which flew in formation from Cairo to Capetown and back in Fairey III F machines. He has described this episode in a recently published book, "A Flight from Cairo to Capetown and Back." In 1929 Samson retired and devoted himself to the pen. His two books make stirring and interesting reading, and he was a constant contributor to the correspondence columns of the *Times*. He was married twice and leaves two children.



The Westland "Wapiti," Mark V, G-AAWA, fitted with an Armstrong Siddeley "Panther," which has been sent out to South America to give demonstrations.

## ENTERPRISE IN LATIN AMERICA

THE Westland Aircraft Works are making a determined effort to uphold the prestige of British aircraft in a decisive manner during the Buenos Aires Exhibition by sending a Wapiti on a visit to that country. During the exhibition Mr. H. J. Penrose, who is accompanied by two of the Westland ground engineers, Messrs. Humby and Russell, will be demonstrating one of their latest Wapitis at the aerodrome of El Palomar.

This particular model is the type modified for army co-operation and fitted with the Panther engine. Floats are also being sent out so that it can be demonstrated as a seaplane or a land machine. This is particularly interesting since it will be remembered that the Wapiti was one of the first machines allocated for the use of the Prince of Wales, and he used a machine of this type a great deal before he purchased his own private machine.

After the exhibition this Wapiti, whose registration letters

appropriately finish with WA, will visit Uruguay and will be demonstrated there both as a land and seaplane. After leaving Uruguay the floats will be removed and it will be flown across the Andes via Uspallata Pass at an altitude of some 13,200 ft. to Santiago, in Chile. After being demonstrated here it will go to Quinteros, where the floats will be re-fitted and it will be demonstrated as a seaplane again.

It is then possible that the tour will extend to Peru and Lima, and the return route will eventually be back to Buenos Aires by the main air route across the Andes. During the exhibition, besides the demonstrations at El Palomar, it will also be flown at Puerto Nueva, and probably at Mato Plata. The Westland Aircraft Works are making a determined effort to further the sales of British aircraft throughout the world, for it will be remembered that we stated that a Wapiti was leaving for China to be demonstrated there by the Far East Aviation Co. at Hong-Kong.

## THE BREDA 19 "AEROBATIC" BIPLANE

THE well-known Italian firm of Breda, of Milan, recently produced a biplane, designed by Ing. Pallavicino, for high aerobatic work. We are able to give some brief particulars of this machine, together with an illustration.

The Breda 19 is an equal-span, staggered biplane, with bi-convex section wings. One pair of inter-plane struts are employed on each side of the fuselage, while the lower wing is additionally braced by a pair of N struts from the top longerons of the fuselage. The top plane is supported by a central inverted V cabane, as well as by two pairs of struts sloping outwards from the fuselage.

We believe the usual Breda wood and steel construction is employed for the wings, while the fuselage, of orthodox rectangular cross-section with top turtle deck, is constructed of welded steel tubes. The covering of the fuselage may easily be removed allowing inspection and adjustment of the controls, etc. The engine mounting is of the detachable type.

Ailerons are fitted to the lower plane only, and are balanced by auxiliary surfaces mounted forward of and above the hinge point. The tail plane, of biconvex section, is adjustable in flight, and the elevators are balanced by being hinged a little way back from the leading edge. A vertical fin and rudder of ample proportions is provided.



THE BREDA 19: A single-seater biplane for high aerobatic work, powered with a 200 h.p. Armstrong Siddeley "Lynx."

The undercarriage is of the "non-axle" type of somewhat unusual design, each wheel being carried by a V attached to the lower plane and fuselage. Landing shocks are taken by a vertical oleo-pneumatic strut. Control cables are doubled, and pulleys are entirely eliminated.

A 200-h.p. Armstrong Siddeley "Lynx" air-cooled radial engine, specially adapted for inverted flying, is fitted.

The principal characteristics of the Breda 19 are:—Span, 9 m. (29 ft. 6 in.); O.A. length, 6.8 m. (22 ft. 4 in.); height, 3.65 m. (12 ft.); wing area, 25 sq. m. (269 sq. ft.); speed range, 76–220 k.p.h. (47–137 m.p.h.); safety factor, 18.

C. de R.





# PRIVATE FLYING AND CLUB NEWS



**THE PHILLIPS AND POWIS FLYING SCHOOL** at Reading started the year well by getting in 107 hr. 40 min. flying for January. They have recently taken on another instructor, in the person of Mr. J. F. Lawn and, no doubt, with his help next month's flying time will be greatly increased. We now frequently hear of foreigners learning to fly at our various schools and clubs, and one of the latest of these is a Chinaman, who has been taught at Reading, Mr. Sin Sin Lyao. He has gone solo and is making excellent progress. The Earl of Northesk has accepted the Presidency of the Reading Aero Club and, no doubt, we shall be hearing more about the club before very long.

**THE LEICESTERSHIRE AERO CLUB.**—It is with great regret that we have to announce the retirement of Mr. Harry Purt from the secretaryship of this club. He was, as is well-known, responsible for the foundation and organisation since its inception two years ago and it has now grown to such a large extent that he finds himself unable to spare sufficient time from his normal duties, to cope with the greatly increased amount of work entailed. The new joint Hon. Secs. are Mr. Sidney Brown, of Rockleys, Limited, Charles Street, Leicester, and R. H. S. Brown of the En-Tout-Cas Co., Ltd., Syston, Near Leicester. We are sorry that Mr. Purt has had to relinquish his position and we feel sure that the hard work which he has put into the club has been the means of laying a foundation for its future prosperity and thereby greatly easing the task which Messrs. Sidney and R. Brown are now taking on. To these latter we offer our congratulations on their appointment and feel sure that under their leadership the club will continue to prosper.

**THE CIRRUS TROPHY.**—The Cirrus trophy, which we illustrated on January 9, has now been competed for at the new South Wales Aero Club, and out of a field of 14 entrants the race for it was won by Mr. Milton Kent in his Westland Widgeon with a Cirrus II engine.

**NORTHAMPTON AERO CLUB** have reason to be proud of their last year's work. They passed 15 pilots for their "A" licence and the number of those in training at the end of December was 64. Although they only have three Moths in commission they were able during 1930 to get in a total flying time of 811 hr. 10 min., which was made up of 486 hr. 20 min. dual instruction, 180 hr. 5 min. solo flying, 47 hr. 25 min. passenger flights, and 97 hr. 20 min. test.

**THE WEST KENT AERO CLUB.**—Mr. P. H. Meadway is forming the West Kent Aero Club which will run in conjunction with the flying school at West Malling. The annual subscription will be £3 13s. 6d. for flying members and £2 12s. 6d. for non-flying members. Anyone who is interested should get into touch with Mr. Meadway at The Billet House, Ash, Sevenoaks, or at the aerodrome, West Malling, Kent.

**CINQUE PORTS Flying Club.**—Weather practically stopped flying on Sunday, February 1, and stopped it completely on Saturday, February 7. On Thursday, February 5, the club's Chinese pilot, Mr. S. T. Sun, returned to the club and introduced a fellow-countryman, Mr. Chen-Chia Dee, who commenced instruction during the week.

On Saturday, February 7, Mr. J. F. D. Beazer, took over the post of chief ground engineer. Mr. Beazer has had 13 years' experience with aircraft work, and has served in the Royal Air Force. He was previously with the de Havilland Aircraft Co., Ltd., where he has been employed partly in looking after competition aircraft.

The month of January was very unsatisfactory from the weather point of view, and only 47 hours were flown, and of these, only 9 hr. 30 min. were put in on instruction.

The total flying time for the week ending February 7 amounted to 10 hr. 10 min., made up as follows: Dual instruction (two members), 2 hr. 15 min.; advanced dual (three members), 2 hr. 15 min.; "A" pilots (four members), 3 hr. 25 min.; tests, etc., 2 hr. 35 min.

**THE SCOTTISH Flying Club.**—At the recent annual general meeting of the Scottish Flying Club, reference was made by the chairman, Mr. J. G. Weir, to the new agreement made between the club and the Air Ministry. He said that November 30 marked the close of the first subsidy period. In the year under review the club had been able to obtain the maximum subsidy, which had enabled them to keep the flying rate down. The new agreement provided only £10 for each new licence and £10 for each renewal, so that it was the duty of pilots who held "A" licences to renew them, and for those who were about to get them to do so as quickly as possible, not only in the interests of aviation, but also in the interests of the club. Alluding to the club's activities, the chairman said that the number of pilots instructed and passed out during the year was 23. It was gratifying that one of their pilots, Mr. T. F. Steele, was chosen to represent the British flying schools in the race for the officers of H.M. Reserve at the Air Force display at Hendon, and, in addition, that he won the event. During the year, Miss Drinkwater obtained her certificate and became the youngest lady pilot in Great Britain.

**INDIAN Flying Clubs.**—During the last few months there has been a certain amount of activity in the United Provinces for the creation of flying clubs. One movement on foot has for its object the linking up of the existing Flying Club at Delhi with those of other centres, instead of the creation of separate organisations run on commercial lines as was suggested at Allahabad. Negotiations have been in progress between Lucknow and Delhi for the extension of flying activities to the former, and a plan has been tentatively drawn up for the formation of an "Upper India Flying Club."



Work in progress in the N.F.S. central workshops at Hanworth Park. (Flight Photo.)



ROUND AFRICA  
BY  
LIGHT 'PLANE



The first A.S.2 light 'plane used by the three Italian pilots in their flight round Africa.

JUST recently three Italian pilots have concluded a remarkable light 'plane tour round Africa, in which 27,600 km. (17,150 miles) were completed in 54 days, including halts, or in 35 flying days. Through the courtesy of Lieut.-Col. P. F. Bitossi, Air Attaché to the Italian Embassy, we are able to publish this week the following brief particulars of this tour, together with an illustration of the type of machine used and a sketch map showing the route followed.

The pilots in question were: Francis Lombardi, an ex-war pilot who has accomplished other notable flights with the Fiat light aeroplane during recent years—for instance, Rome-Mogdishu (Italian Somaliland), and Vercelli (Italy) to Tokio. Count Mazzotti, a noted Italian sportsman, owner of the Isotta Fraschini works, and an enthusiastic motor racer. Ingegnere Rasini was the third member of the "raid."

This flight was carried out with Fiat A.S.2 high-wing monoplanes, fitted with Fiat 90-h.p. A.50 air-cooled radial engine. With the exception of some slight damage to Lom-

bardi's machine, as a result of his landing on swampy ground, all machines and engines went through the tour without any trouble.

It will be seen from the accompanying map that on the outward journey the three pilots after striking Africa at Tripoli, and following the coast to Cairo, followed the Imperial Airways Cairo-Cape route. They completed the outward journey in 16 days, and stayed two weeks at Cape Town.

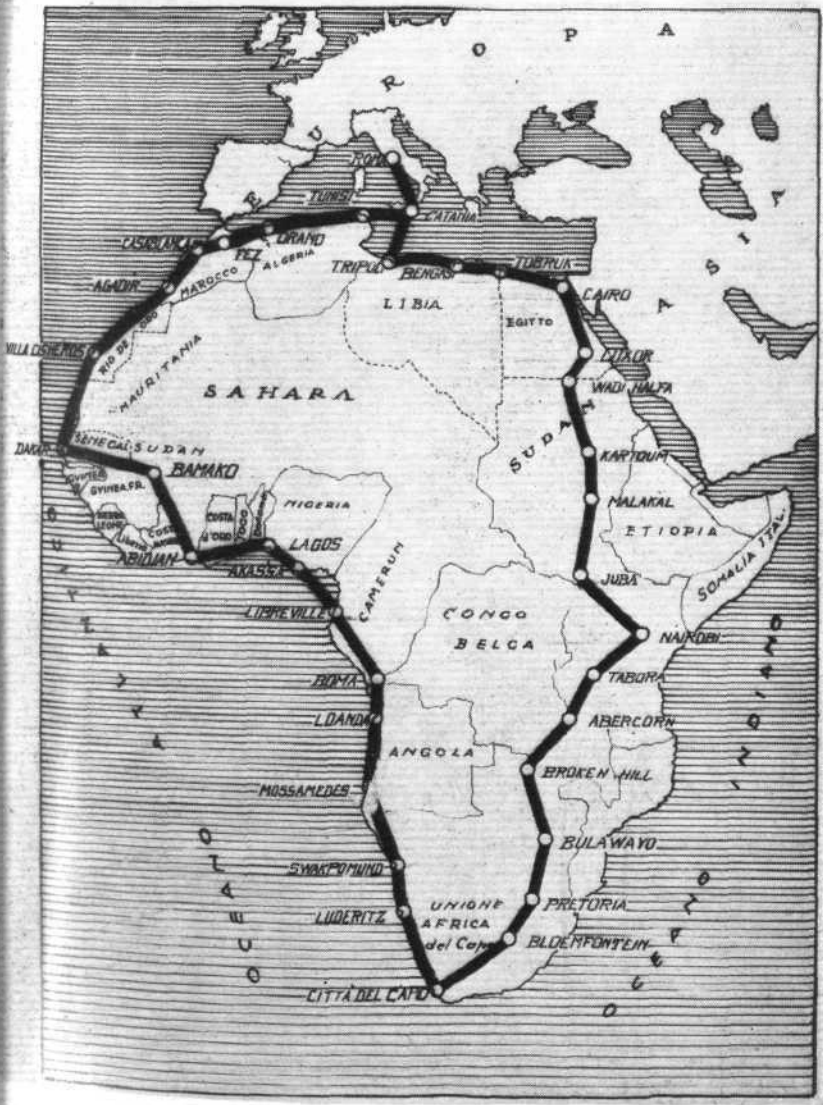
On the return journey they followed the west coast route, spending ten days at Lagos, and later meeting Gen. Balbo's Atlantic squadron just before it set out for Brazil.

The daily log of both outward and homeward flights are as follows:—

Outward.			Miles.
1930.			
Oct. 28	Rome-Catania ..	404	
" 29	Catania-Tripoli ..	372.8	
" 30	Tripoli-Benghazi ..	590.3	
" 31	Benghazi-Tobruk ..	130.5	
" 31	Tobruk-Cairo ..	621.4	
Nov. 1	Cairo-Luxor ..	497.1	
" 2	Luxor-Wadi Halfa ..	298.3	
" 3	Wadi Halfa-Khartoum ..	385.2	
" 4	Khartoum-Malakal ..	528.2	
" 5	Malakal-Juba ..	372.8	
" 6	Juba-Nairobi ..	590.3	
" 7	Nairobi-Tabora ..	372.8	
" 8	Tabora-Abercorn ..	310.7	
" 9	Abercorn-Broken Hill ..	466.1	
" 10	Broken Hill-Bulawayo ..	553.1	
" 11	Bulawayo-Pretoria ..	422.5	
" 11	Pretoria-Bloemfontein ..	279.6	
" 12	Bloemfontein-Cape Town ..	571.7	
Total distance ..			7,767.4

Return.			Miles.
1930			
Dec. 4	Cape Town-Luderitz ..	621.4	
" 5	Luderitz-Swakopmund ..	310.7	
" 6	Swakopmund-Mossamedes ..	621.4	
" 8	Mossamedes-Loanda ..	559.2	
" 9	Loanda-Boma ..	310.7	
" 10	Boma-Libreville ..	559.2	
" 11	Libreville-Akassa ..	621.4	
" 12	Akassa-Lagos ..	279.4	
" 22	Lagos-Abidjan ..	621.4	
" 23	Abidjan-Bamako ..	621.4	
" 24	Bamako-Dakar ..	621.4	
1931			
Jan. 1	Dakar-Villa Cisneros ..	745.7	
" 2	Villa Cisneros-Agadir ..	621.4	
" 3	Agadir-Casablanca ..	310.7	
" 4	Casablanca-Fez ..	217.5	
" 5	Fez-Oran ..	372.8	
" 7	Oran-Tunis ..	621.4	
" 9	Tunis-Naples ..	621.4	
" 11	Naples-Rome ..	124.3	
Total distance ..			9,383.0

Total distance out and home, 17,150.4 miles.



ROUND AFRICA BY LIGHT 'PLANE: Map showing the out and home routes.



# GLIDING



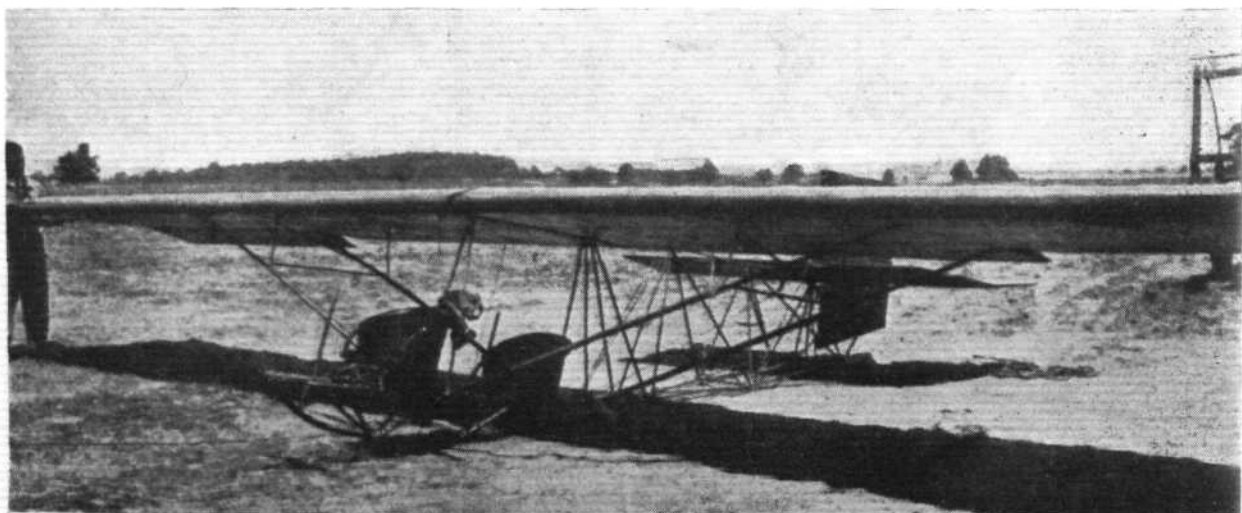
**AUTO TOWING.**—Being an extract of a letter sent to Col. the Master of Sempill by Mr. A. C. Haller, of Haller-Hirth Corporation, Pittsburg, U.S.A. Mr. A. C. Haller was a great help to the British Gliding Association during their Kronfeld demonstrations, and has been good enough to send the following information concerning American experiments and developments.

"I have not until now been in a position to give you any useful or accurate information on the auto-launching methods used in the U.S.A.; in fact, I was not convinced at first of its practicability. Since my return, however, I have found it has taken on. It is true that a number of pilots were killed by doing things with Zöglings towed by automobiles that should not have been done.

"Some of the things that should not be done are towing down wind or across wind because the speed necessary is too great in the first place and the control re-action is not accurate in the second place. *Towing machines through curves is a most dangerous practice* as the banking in this is not that of a normal flight curve due to the pull on the cable. Zöglings and other primary planes should not be towed on flights any higher than 4 ft. to 5 ft. from the ground as they do not have enough horizontal control to overcome the vertical pull of the tow cable at higher altitudes. Strong cable should be used ( $\frac{1}{4}$ -in. manilla rope is plenty strong enough and a short length of standard  $\frac{5}{8}$ -in. rubber shock absorber cord may be used in combination with the rope to allow for more elasticity). I do not recommend the auto-towing system except by reliable pilots who are accustomed to it and who have had sufficient experience to feel able to instruct others. The equipment necessary for towing is an automobile with quick acceleration on which should be mounted an air-speed indicator with the pitot head mounted on a mast about 10-15 ft. above the ground, a rear vision mirror of a good size so that full vision of the rear is given, a rope  $\frac{1}{4}$  in. in diameter 300-400 ft. long; two simple revolving hooks (such as bomb release hooks) one mounted on the car to be released by the driver and one on the plane to be released by the pilot; a glider with a single air wheel or in the case of a "Zögling" two wheels of smaller diameter and with the smallest possible drag so as to make it possible for the student to get accustomed to the lateral controls without leaving the ground. With the Zögling wheels should be placed nearly in the centre or in other words slightly behind the centre of gravity so that when the plane is at rest or travelling at a slow speed the plane noses down and the skid acts as an automatic brake. This also keeps the tail from coming in contact with the ground when the plane is being towed at a slow speed and thereby eliminates a lot of repair to this member which is not designed to take too much shock. The student pilot should first be taxied down the Air Port to become familiar with the controls. His first and hardest job then is to learn to get the plane straight behind the car. This familiarises him thoroughly with this most important control. During this period the student should be told not to attempt

to use his elevator but to hold it in as near a vertical position as possible. It might even be well to limit the elevation travel after a neutral position or a slight tail heavy position has been determined, for it in this case can be controlled by the car driver either increasing or decreasing his speed as the plane at rest on its wheel is slightly nose heavy. It will be found that by the time the student has mastered the rudder control he need be told very little about the lateral controls as he is constantly becoming accustomed to them by just holding the stick. After a very short period of time it will be found that the student can handle the elevator and all the controls well enough to be towed the whole length of the Air Port and keep the plane one or two feet from the ground *providing the car driver has learnt to control the speed of the car and keep it fairly straight*. The fact of the matter is that the greatest burden of all rests on the driver, as he must know his job perfectly. He can pull the student out of a slip by slowing down or releasing when the slip is bad. In case the student is stalling he can set him on the ground by just keeping the rope tight and gradually stalling down. There are numerous other little tricks the driver can learn by experiment that are too numerous to mention in writing, that is why I suggest that you assign two pilots to experiment before you promulgate the idea too much upon individuals who might be prone to carelessness, such as our American pilots were. You will probably find that a secondary machine such as the Prüfling is well adapted to auto-towing and is even better than the Zögling, as this has proved true in this country. The secondary type has to be used in the advanced stages of the work and is just as serviceable as the primary type and is not any more expensive to keep in repair. For the very first flight with a student, it would be well to use 100 ft. of rope so that the driver can steer the plane back on its course by jerking the nose when the plane comes out of line with the car. When the pilot is more experienced and can reach a fairly high altitude he should dive a little before he releases to gain more speed than the car and thereby avoid stalling. It is advisable to tie two or three pieces of white cord on the towing line so that the driver can see if the pilot is released or not so that he may release if necessary."

**THE AIRCRAFT CLUB, HARROGATE**, has completed its first year of working, and it may interest other clubs to know that very few members paid more than 10s. subscription, yet it was able to finish the first year with a small credit balance in hand. Furthermore, this is probably the only club which first of all started with a constructional section for its members. They built their first glider, a Dickson-type training glider, and the experience gained with this, together with the talent they have available, has enabled them to cope with all repairs themselves. The annual general meeting was held in the clubroom on January 16, with Mr. Woodmansey in the chair. The first glider was completed and taken to Healthwaite Hill on November 15 and success-



**AN AMERICAN TWO-SEATER GLIDER:** This machine was designed by the Leonard Motorless Aircraft Corp. for dual instruction. The fuselage is of steel tube construction.



fully flown, and meetings have been held there every Sunday since that date. Over 115 flights have been made in this machine in winds of from 1 to 40 m.p.h. During the year several interesting papers have been read before the club which have greatly helped to maintain the members' interest. On July 9 and 10 the club obtained the services of Herren Kronfeld and Magersuppe, and a demonstration was organised on Bemsley Beacon together with the Ilkley Gliding Club. At this meeting many fine soaring flights were made by both pilots, and each evening they flew their machines back to a field in Ilkley some six miles distant. On August 30 and 31 the first meeting of the Association of Northern Gliding Clubs was held, which association has since developed to be a power in the northern gliding world. There is no doubt that this has become one of the most successful clubs formed during the last year, and in constructing and maintaining their own gliders the members have undoubtedly shown others the way in which gliding clubs should be run.

THE BRITISH GLIDING ASSOCIATION are now able to supply full drawings of the FALKE secondary type of training glider. As readers will be aware, this is an improved PRÜFLING and is able to soar in light breezes while at the same time being safer and easier to fly than the latter. These drawings are only available to individual members of the British Gliding Association and affiliated clubs on application through the Secretary and will only be supplied on it being agreed that the machine is to be built for sport and instructional purposes only and not for commercial manufacture, and a further sale to any party for commercial manufacture is not allowed. The cost of the drawings is £3 and there is also an R.R.G. licence fee of £2. People requiring these drawings should apply to the Secretary of the B.G.A., 44a, Dover Street, W.1.

The Association is gradually building up a library for the use of its members and affiliated clubs, and the following books are at present available:—"Gliding and Soaring Flight," by Jose Weiss; "Flying," by Claude Graham White; "Evolution in the Flying Machine," by Harry Harper; "Gliding and Motorless Flight," by C. F. Carr and Howard Flanders; "Gliding and Sailplaning," by F. Stamer and A. Lippisch. If any members have spare copies of any other books on gliding and aviation in general, to spare, the Association would be glad to receive any copies.

On January 29, an extremely interesting lecture was given by Herr A. Lippisch on "The Development, Design and Construction of Gliders and Sailplanes," before the Royal

Aeronautical Society and the British Gliding Association. This lecture was one of the most comprehensive and interesting that had been given on the subject in England, and all those who were unable to attend should make a point of obtaining the Aeronautical Society's journal when it is published with this lecture in full. Unfortunately, space does not allow of our reproducing it here since to do it in anything but a full manner would, in view of its importance, be worse than useless. It will, however, be published in the journal in due course, and all those who are interested in the design of gliders, both the training type and high efficiency type, will benefit very greatly from reading it.

THE SOUTHAMPTON Gliding Club had a successful weekend's flying, when several "ab initios" made their first hops. Nearly all S.G.C. members have "passed out" of the first phase of instruction and all of these have now actually flown.

At the first flying meeting three thousand spectators witnessed a fine display of gliding by the instructors of the club. Amongst those present were the Mayor of Southampton, Councillor E. W. Cross; Sir A. V. Roe, who has consented to become a vice-president; and Mr. Waplington, secretary of the B.G.A.

The club hopes soon to move to an advance training ground near Droxford. Further particulars of the club may be obtained from the Hon. Sec., L. W. Matcham, 14, Cumberland Place, Southampton.

THE SAILPLANE CLUB are holding their Social and Dance at the Suffolk Galleries on Saturday, March 7. This is being held in order to raise extra funds for the completion of the club hangar and so that the club may start the 1931 season in a good position. Tickets for this dance may be obtained at 2s. 6d. each from the secretaries, Mr. E. G. Smatten or Mr. A. E. Jones. A great effort is being made to enrol more members, and everyone who is interested in the welfare of the club should endeavour to help in this direction.

LECTURES CONCERNING GLIDING.—Those interested in gliding should remember that on February 26, Capt. F. Entwistle will be lecturing before The Royal Aeronautical Society on the "Meteorological aspects of gliding and soaring," while on March 19, Dr. W. Hoff will deliver a lecture "Research in the Berlin Technical High School." Both these lectures will be at the Royal Society of Arts, 18, John Street, Adelphi, W.C.2, and will begin at 6.30 p.m.

## CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

### THE ZOGLING TYPE GLIDER

[2366.] I FEEL compelled to reply to your remarks concerning the Zögling type training machine, which have appeared under gliding notes in your two most recent issues.

I find it difficult to take seriously your remark "that the Zögling fulfils no real place at all." Such sweeping criticism of a machine or type which has been used as a training machine for a period of no less than seven years, and on which there is no record of a single fatal crash, and at the Wasserkuppe alone some thousands of pupils have been trained on it.

I have myself witnessed a number of crashes, both here and in Germany, which I have not the slightest doubt in saying would undoubtedly have resulted in very serious injuries to the pilot, had it been an enclosed fuselage machine. Two other great advantages are that the Zögling type has the structural strength to withstand maltreatment on an almost unprecedented scale, and secondly, instruction of *ab initio* pilots is simplified as the instructor can see exactly the action of the pupil from almost any angle.

I am, however, far from being an opponent of towed gliding under proper supervision, and believe that it offers considerable possibilities for development, in spite of its gory record in America. As one who has tried and observed both catapult launching and auto-towing, however, I say most emphatically that the Zögling fulfils a very real place, and I believe that auto-towed training will eventually be carried

out with the greatest possible satisfaction on a suitably modified Zögling. Undoubtedly, the best summing up of the whole situation was forthcoming in Herr Lippisch's recent and brilliant lecture, when he said "One doesn't learn to ride on racehorses."

"NOMAD"

The Royal Aero Club,  
London, W.1.

January 30, 1931

### KING'S CUP, 1931

[2367.] The regulations for the above and Commander Glen Kidston's letter point to the need of a definition of "amateur" or "professional." The Royal Aero Club, or, better, the Fédération Internationale, might make it. The task is not going to be easy, but a study of the definitions enforced in cricket, athletics, rowing, tennis, race-riding, etc., would aid.

Officers of the R.A.F., learning and practising at the expense of the State, would, if classed as amateurs, have advantages, but so have officers of the Army in jump races. Yet the latter have always weighed out as "gentlemen," not as "professional," jockeys, and the sport has not suffered.

AMATEUR

North Walsham.  
February 6, 1931.

## BOOK REVIEWS

## FOR THE PLAIN MAN

Most books about flying are too expensive. A book written for the plain man (one must resist the temptation to think that some pun about 'plane is intended) should be cheap, and 3s. 6d. seems a very suitable price. Such a book must be accurate, must be matter-of-fact (with no hint of a "stunt" in it), must not be technical, and must be written in sound readable English. These seem to be the chief essentials, and the Master of Sempill's book satisfies all these requirements. Therefore, it is a good book, for it achieves what it set out to do. It will not be of much use to the ordinary reader of FLIGHT, but we hope that very many other members of the public will buy it and read it. It will do them good, and we shall be surprised if most of them do not end up as readers of FLIGHT, that is to say, as converts to the gospel of air-mindedness. F. A. DE V. R.

"The Air and the Plain Man." By Colonel the Master of Sempill, A.F.C., F.R.Ae.S. (Elkin Mathews and Marrot; 3s. 6d. net.) Obtainable from FLIGHT Office.

## A GLIDING LIBRARY

THE recent boom, one might almost say the mushroom-like growth of gliding, particularly in this country during the past year has naturally produced its attendant crop of literature. We now have three books of varying value on the subject. The first of these is "Gliding and Motorless Flight," by L. Howard-Flanders and C. F. Carr; the second "Gliding, and Sail-Planing," by F. Stamer and A. Lippisch; the third "Gliders and Gliding," by R. S. Barnaby. Mr. Howard-Flanders' book is distinctly disappointing. Coming as it does from one who has been associated both practically and theoretically with aviation since the very earliest days, we are naturally entitled to expect a book much more commensurate with the knowledge which we know he possesses. There are many cases where the statements made are frankly inaccurate, and we can only assume that the book was got out in such a hurry that the all-important question of editing was slurred over. For instance, on page 21, under a sub-heading of "Static Soaring" we find the following sentence:—"When the horizontal wind is variable the pilot gains height as the velocity decreases," while on page 16 under the sub-heading of "The Plane" we find the statement "The plane is merely a development of the lifting power of the kite. It maintains its position in the air by virtue of the air pressure on its under surface." It is a great pity that misleading statements like this should have been included, since they will detract from the value of the book for all those who know anything about the subject. There is also a chapter included on gliding for women, taking up six pages, the justification of which is very obscure. There are of course, several lumps of meat in it, but one has to search round amongst a stew of redundant vegetable matter, as it were, to find them. The second on our list, by Herr Stamer and Herr Lippisch, is again a trifle disappointing, but it contains rather more valuable practical matter in the form of actual results obtained during the work of the joint authors. Herr Stamer is the principal of the German Gliding School at the Wasserkuppe, while Herr Lippisch is Chief Designer and Principal of the Technical School at the same place, both of which are run by the Rhön-Rositten Ges., and as such they have a larger store of practical knowledge upon which to draw than anyone else connected with the sport. The translation has on the whole been well done, and the book itself is admirably produced. It is of course entirely descriptive of German principles and as such needs a little modification to correlate it with our English ideas. Taking it on the whole, however, it contains a wealth of detail which no club could afford to be without. "Gliders and Gliding" is an American book by Mr. Ralph S. Barnaby, who claims to be the first American first class glider pilot. Like most American productions it sets out to make the most of the wide scope allowed by the subject and inevitably fails by ending up in giving one only a smattering of many sides of it instead of a thorough knowledge of any part of the subject. The reader had to allow for the nationality of the author in the previous volume, and he must do likewise here; but here again he can do so with profit and the book is certainly worth consulting by those who wish to have a wide knowledge of the subject. "DAEDALUS."

"Gliding and Motorless Flight," by O. Howard-Flanders and C. F. Carr (Sir Isaac Pitman & Sons, Ltd.). Price 8s., post free.

"Gliding and Sail-Planing," by F. Stamer and A. Lippisch. (The Bodley Head, Ltd.). Price 5s. 6d., post free. Both obtainable from FLIGHT Office.

"Gliders and Gliding," by Ralph S. Barnaby. (The Ronald Press Co., 15, East 26th Street, New York, N.Y.), price \$3.

## PRACTICAL FLYING GUIDE

CAPT. W. J. McDONOUGH has added yet another volume to the library available for the student of practical flying. This is rather more complete than most we have had, since it includes the operation of aircraft not only in the air but also on wheels, skis and floats. It is a really good book, inasmuch as it is thoroughly practical; there is a sufficiency of technical matter in it describing the theory of flight in a clear and concise, and what is more important, accurate manner, and though this section is of necessity small, it will certainly act as a very palatable introduction to the younger generation of pilots on the theory of aerodynamics. Capt. McDonough it will be remembered was flying instructor at the Midland Flying Club from 1925-27, and since this time he has had much varied experience of the conditions ruling in Canada. In his Preface he expresses an opinion which has long been held among firms operating aircraft, but which when expressed, has naturally raised a great deal of controversy here. It would appear to be basically true since we have often heard of extremely good pilots of the type to which he refers being of little use in commercial life. He says "Many people wonder why there are so many hundreds of pilots out of employment; pilots who did so well in the war and those who have more recent experience. I refer to time-expired short-service commission officers from the Royal Air Force and other air services. It is not solely because there are not the jobs for them, but more so because they have not the training or knowledge which is so necessary for civil life. Also, they still retain the service attitude, which, in its place, is not only excellent but necessary, but a qualification totally unsuited to the commercial pilot. A complete democracy gives us the reason for this situation. For these reasons, directors of aerial operations prefer to train their own pilots *ab initio*, in preference to employing the ex-service pilot, good as he may be. Student pilots and those who are contemplating taking up commercial aviation as a profession, should be warned by this situation and realise the fact that actual flying will be but a small part of the duties of the future commercial pilot who expects to command a good salary."

It is one of the few books in which there is very little redundant matter. The author has confined himself to just those details which are absolutely and vitally necessary for the embryo pilot to absorb, and he has put forward all those details in language which nobody will have any difficulty in understanding. "DAEDALUS."

"Airmanship," by John McDonough (Sir Isaac Pitman & Sons, Ltd.). Obtainable from FLIGHT Office, price 8s., post free.

## A VALUABLE BOOK

"AIRPORTS, Their Location, Administration and Legal Basis," is the title of Vol. I of the Harvard City Planning Studies, and is composed of three papers, the first entitled "The Airport in City Planning," by H. V. Hubbard and H. K. Menhinick; "The Airport Administration" by M. McClintock and P. Mahoney; and "The Law of Airports," by F. B. Williams. Taken as a whole, these papers together with the subsequent tables and lists in the appendix form one of the most valuable contributions to the establishment and operation of airports we have seen. It is of course essentially American and therefore those interested in airport or aerodrome management over here will have to bear this fact in mind, and adapt many of the views expressed accordingly, but notwithstanding, the book will undoubtedly be of great use to them. As in common with the majority of such American publications, it is very largely statistical and is full of tables which form an exceedingly clear basis of comparison of a large number of airports in the U.S.A. Although there are a fair number of illustrations of airports and airport buildings, these illustrations rather leave one with a sense of something wanting and the book would have been much more valuable had the illustrative matter been increased. That, however, does not seriously detract from the value of the book and it is one that should be in the hands of all those interested in the subject. We in this country not only lack airports, but also lack data which will assist those operating the existing ones, and if the development which is foreshadowed for the forthcoming year takes place, it will outstrip our existing knowledge of the subject, which again makes this book more than welcome. "DAEDALUS."

"Airports, Their Location, Administration and Legal Basis," by H. V. Hubbard, H. K. Menhinick, M. McClintock and F. B. Williams (Harvard University Press). Published in England by Mr. H. Milford (Oxford University Press). Obtainable from FLIGHT Office. Price 15s. 9d., post free.



### "LITTLE AMERICA"

"LITTLE AMERICA" was the name given by Richard Evelyn Byrd, Rear-Admiral, U.S.N., ret., to the camp which formed the base of the Byrd Antarctic Expedition, 1928-29. The story of that expedition is admirably told by Rear-Admiral Byrd in his recently published book\*. The author does not pretend that his account of the expedition is a scientific exposition of the results obtained. That he leaves to the various specialists who accompanied him. But the tale Byrd has to tell is one which, while not minimising the risks, makes the most of the exhilaration which follows narrow escapes. And of these the members of the expedition had a fair share. And after reading the book one thoroughly endorses the author's one-word comment on criticisms made by ill-informed writers in America to the effect that the Byrd expedition was too luxurious and too much without adventure. To this allegation Byrd merely replies "rubbish." And, in fact, the remark was rubbish. Adventures there were aplenty, and if some of the hardships suffered by earlier explorers were avoided by good and modern equipment, that same equipment brought with it problems and risks of its own.

Although aircraft and radio proved time and again of the very greatest help—in fact, marvellously so—it is not to the work accomplished with their aid that the greater part of the book is devoted. On the contrary, the bulk of the book relates the details of the planning of the expedition, the choice of equipment, the transport of that equipment to the base at "Little America," the building of the camp, and the large amount of ground work which was carried out. The actual flights occupy but a relatively small portion of the book, and in this respect the arrangement of the book reflects the whole plan of the expedition. All the paraphernalia was collected and transported to the base on the barrier, largely in order that flights might be made to the South Pole and to various districts east and west of the base. The expedition took something like six months. The actual flight to the South Pole took a few hours. But the former was necessary in order to accomplish the latter. A pleasing feature of "Little America" is the generous praise which Byrd throughout gives to his companions. His was the responsibility, and a very great one. To his comrades he gives all the credit. And even when he is compelled, for the sake of truth and accuracy, to blame a few, a very few, members of the expedition, his blame is tempered by a full and sensitive understanding of their difficulties.

To readers of FLIGHT that part of the book will probably be found most interesting which deals with the flying side, although anyone interested in polar exploration cannot fail to enjoy the entire book from cover to cover. The three aircraft which the expedition took to the Antarctic were a Fokker Universal, a Fairchild single-engined monoplane, and a three-engined Ford. It was the latter on which the flight to the South Pole and back was made, but the Fairchild also did an extraordinary amount of very useful work. The Fokker Universal made but one flight, and was wrecked on the ice by a fierce gale. The story of the efforts of the crew to save it is well told.

On the whole, neither aircraft nor engines gave any serious trouble. Once a fire was narrowly averted. A canvas cover with a spout to go over a stove was used for warming the engines, and on one occasion the cover caught light and nearly set the machine on fire. In the air technical troubles appear to have been almost non-existent, due, doubtless, to the thorough and skilful attention given to the flying equipment by the engineers. Time and again Byrd relates how, while actually flying in one of the machines, he was able, by messages relayed from "Little America," to keep in touch not only with the base on the barrier, but actually with his New York office. The time saved, and what is even more important, the risks avoided or at least minimised by the use of the extensive radio equipment, is something to be wondered at, and never surely have the blessings of radio been better appreciated than by the members of the Byrd expedition. The general impression is that the expedition mostly used radio for listening to "jazz" from broadcasting stations. Nothing could be much farther from the truth. Radio enabled Byrd, while cut off from the rest of the world, to direct, from his camp at "Little America," not only the operations of his various sledge parties, but the loading, &c., of his ships in New Zealand, and even the ordering of a fresh dog team from New York. The story of the flight to the Pole is fascinating, and one shares the intense nervous tension of the crew when it became necessary to jettison valuable supplies in order to enable the machine to climb through a gap in the mountains. Had engine failure made a forced landing necessary, those supplies

might have meant the difference between life and death. No forced landing, fortunately, had to be made, and so the supplies could be spared. But the decision was not an easy one, and Byrd is revealed by the following sentence in this connection: "The Pole, after all, was our objective." And so it was supplies and not petrol that was jettisoned. The book is illustrated by some excellent photographs, of which the aerial views are particularly fine.

*Little America.* By R. E. Byrd, Rear-Admiral, U.S.A., ret. Published by G. P. Putnam's Sons. Obtainable from FLIGHT office. Price 21s. net.

### A COMPREHENSIVE HANDBOOK

"AVIATION OF TO-DAY," one of the "Woodside and Woodland" series of small handbooks which are published on many varied subjects has been compiled by Mr. J. L. Nayler and Mr. E. Ower, Secretary and Assistant Secretary respectively of the Aeronautical Research Committee. The book opens with a Foreword by Lt.-Col. Mervyn O'Gorman, and there is a chapter on aircraft engines by W. J. Stern. There have been few books on aviation published recently which contain such a wealth of detail, and which cover the subject from A to Z in a manner capable of being so easily assimilated by even the veriest tyro. It is altogether an exceptionally attractive little volume, well got up and profusely illustrated, many of the illustrations being in colour. Undoubtedly such a wealth of illustrations adds very greatly to the value of such a book, and makes it far more readable. The majority of these are from photographs, and were obtained from FLIGHT. The authors, as Lt.-Col. Mervyn O'Gorman says, are certainly no smatterers, and they know their subject intimately, and therefore the accusation of being superficial, or of a lack of thoroughness, cannot be laid at their feet. The scope of a book like this is, of course, enormous, and at first sight would appear to be far greater than can reasonably be tackled in such a small volume. It has been done, however, and in a very successful manner. Naturally, details have, in many places, had to be sacrificed, and there are a fair number of errors which one would have thought could have been seen and corrected when reading the proofs. There is no doubt that this book forms one of the best media we have seen for educating both the young and old who wish to learn what aviation was and is. "DÆDALUS."

*Aviation of To-day*, by J. L. Nayler and E. Ower (Frederick Warne & Co., Ltd.) Obtainable from FLIGHT office. Price 15s. 9d. post free.

### "HOW TO BECOME AN AIR PILOT"

MR R. L. PRESTON has just revised his admirable little book, and the new second edition is a mine of information for anyone who is thinking of taking his "A" licence. The revision has mostly taken the form of additions, many of which are admirable, but some we frankly cannot see the point of. These latter include a list of gliding clubs and regulations concerning the attainment of a gliding certificate. Exactly why this should be in a book which primarily concerns licences for power-driven aircraft pilots is a little hard to understand, but no doubt Mr. Preston, wishing to be up to date, has included these sections, in view of the hold which gliding has gained within the last few months. It is a pity, however, that when doing so he did not make it a little more comprehensive, and why he included only 47 out of some 80 gliding clubs now in existence is difficult to understand. With regard to the other parts of the book, the paragraphs on "existing subsidy arrangements" have been brought up to date. The list of flying clubs has been enlarged and now includes their individual schedules of subscriptions and flying fees, including the secretary's address, but here again there are several clubs left out, which seems a great pity.

The chapter on the technical examination remains in general the same, and is still one of the most admirably arranged lists of the questions asked that we have seen. The paragraph in this section concerning flying to Egypt has been enlarged and brought up to date in a similar way that the part of the book dealing with "Flights Abroad and Customs" has been. This latter now includes a list of countries where permission to fly is required, and the time required for making the application.

There are also new sections designed to be of great use to those making flights across the Straits of Dover, and when flying on the Croydon-Lympne air routes under conditions of bad visibility. Altogether, there can be very little information which the embryo pilot requires, apart from flying instruction, that he cannot get from this admirable book.

*How to Become an Air Pilot.* By R. L. Preston. (Sampson Low, Marston & Co., Ltd.) Obtainable from FLIGHT office. Price 3s. 6d.



# AIR TRANSPORT

## SIR ERIC GEDDES ON THE FUTURE

ON February 5, the Right Hon. Sir Eric Geddes, G.C.B., G.B.E., K.C.B., Chairman of Imperial Airways, Ltd., read before the Marshall Society of Cambridge University, an extraordinarily interesting paper entitled "The Commercial Future Prospects of Aviation." It is regretted that space does not permit of publishing the paper in full, but it is hoped that in the following summary no really important point or statement has been omitted.

Sir Eric began by outlining the history of the progress of transport speed, and showed an interesting graph of growing speeds by stage coach, steamship, automobile, railway and aircraft.

Turning to post-war development, Sir Eric showed a map of the world's arterial airways, including only such as are operated regularly over routes 1,000 miles or more in length, and omitting all shorter routes, feeder lines, etc. Six of the longest routes in regular operation totalled 28,000 route miles. The total time of travel by surface transport was 78 days and by air 36 days. On these routes passengers were carried at a total air fare of £628 compared with £348 by rail and sea, and a representative figure of about 5s. 7d. was obtained for the average extra charge to a passenger for each hour of time saved. Or, as Sir Eric said, air travel gets you there in less than half the time at about 80 per cent. extra cost. Sir Eric then gave a table showing fares and time saved on six of the world's great air routes:—

carrying a pay load of but little more than 1 lb. per h.p. of its single engine. The Handley-Page 0/400 had an inferior performance, but carried a pay load of 3½ lb. per h.p. of its two engines.

### Representative British Commercial Aircraft.

Type	D.H.34	Handley-Page W.8B	Armstrong Whitworth "Argosy"	Handley-Page 42 (Estimated figures) 1931
Year of introduction	1922	1922	1926	1931
Number of engines ..	1	2	3	4
Total horse-power ..	450	720	1,200	2,300
Total weight (lb.) ..	7,200	12,500	18,000	29,500
Weight per h.p. (lb.)	16.0	17.4	15.0	12.8
Stalling speed (m.p.h.)	61	52	54	53
Maximum speed (m.p.h.)	115	100	112	127
Cruising speed (m.p.h.)	95	85	90	105
Normal range (miles)	300	300	300	300
Number of crew ..	2	2	3	4
Paying load (lb.) (excluding crew) ..	1,100	2,300	3,700	7,750
Paying load per h.p.	2.4	3.2	3.1	3.4
Number of passengers carried ..	6	12	18	38

### Comparison of Fares and Time Saved on Six of the World's Arterial Airways.

Route			Time of Single Journey			Passenger Fare for Single Journey		Time Saved	Extra Fare per Hour of Time Saved	
From	To	Air Mileage	1. By Air	2. By Surface	3. Saving	1. By Air	2. By Surface	per 100 Miles	Hour of Time Saved	
								hr.	s. d.	
London	.. Delhi ..	5,544	7 days	17 days	10 days	£133	£86½	4½	3 10	
London	.. Capetown ..	7,944	11 "	17 "	6 "	125	70	3	7 6*	
Marseilles	.. Beyrouth ..	1,875	2 "	7 "	5 "	65	42½	6¼	3 9	
London	.. Moscow ..	1,740	28½ hr.	60 hr.	31½ hr.	23¾	20¾	2	2 0	
New York	.. San Francisco ..	2,600	2 days	4½ days	2½ days	46½	30	2¼	5 6	
London	.. Batavia ..	8,550	13 "	30 "	17 "	235	98½	4¾	6 8	
Totals ..			28,253	36 days	78 days	42 days	£628¼	£348¼	3½	5 7
Average.									Average.	

\* This is a provisional figure ; the extra cost will be less when the London—Capetown air time is reduced.

The next part of Sir Eric's paper dealt with the development of air transport from its inception in 1919. Reference was made to the use at first of converted war-time machines, followed later by aircraft specially designed for commercial flying. Taking two examples, Sir Eric recalled that the D.H.4 was a machine of relatively high performance, but

Sir Eric then traced the reasons which had gradually led from single-engined aircraft to the adoption of multi-engined machines. The three-engined aircraft was now, he said, giving way to its four-engined successor. But the success of the multi-engined type had entailed some loss of pay-load capacity and some loss of performance.

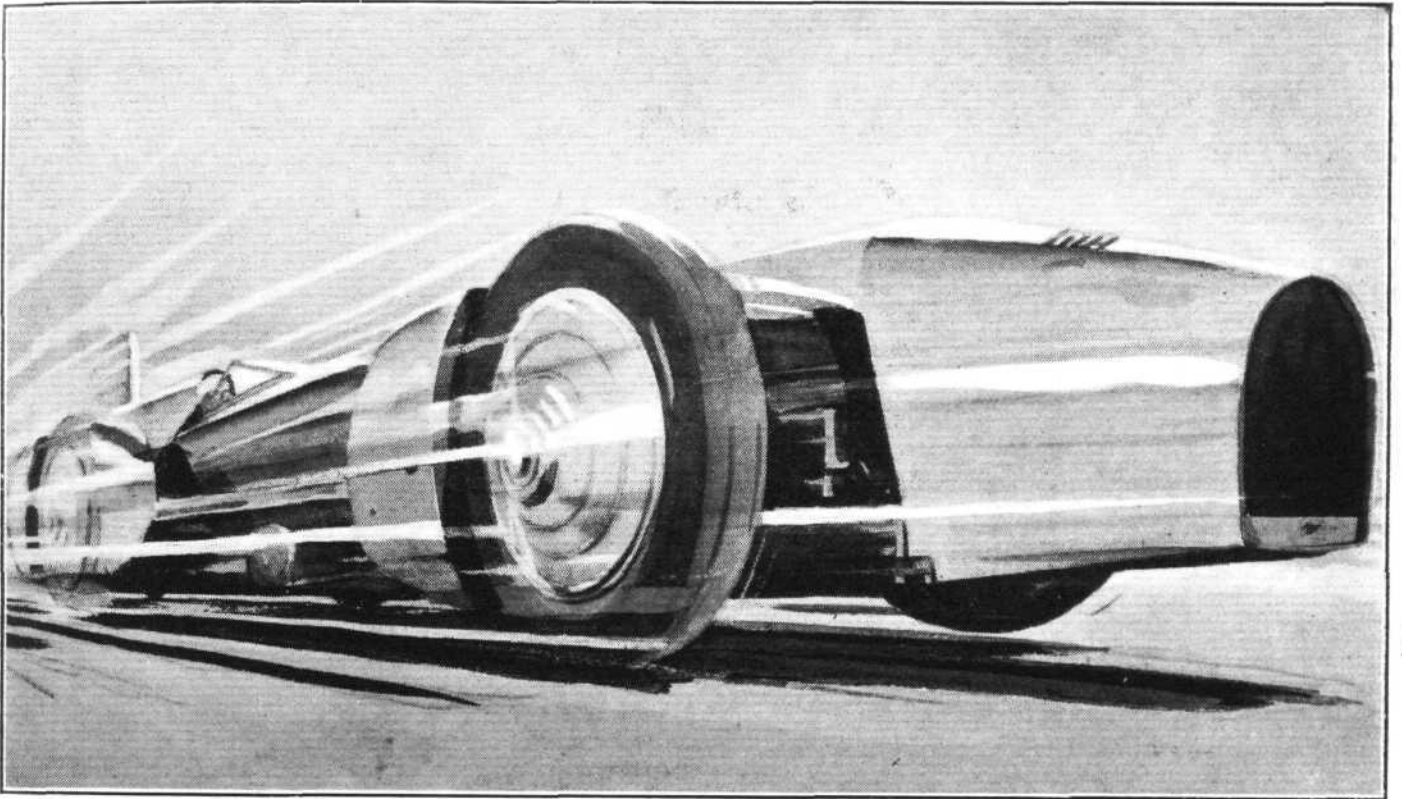


THE DE HAVILLAND D.H.34 : Fitted with Napier "Lion" engine, this represented the high-performance type of 1922. (FLIGHT Photo.)





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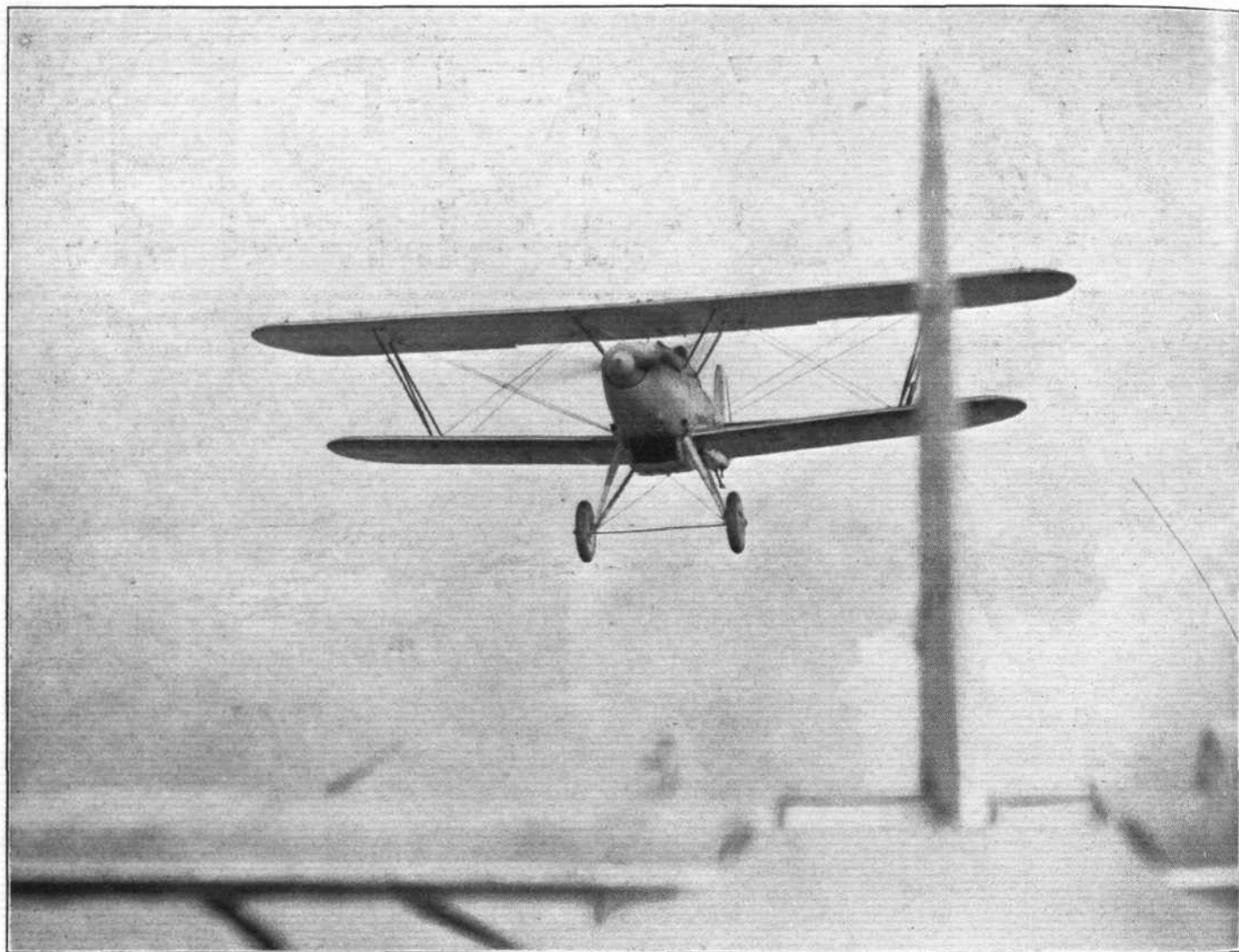
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THE HANDLEY PAGE W.8B : Also of 1922 vintage, this machine was twin-engined (2 Rolls-Royce "Eagles"). (FLIGHT Photo.)

Fortunately, the advent of the large aircraft with four or more engines had to a great extent eliminated the commercial objections raised in the earlier days.

Until quite recently the cruising speed of British commercial aircraft had generally been below rather than above 100 m.p.h., while the pay-load per h.p., taking a common fuel range of 300 miles, had been below rather than above 3½ lb. One thing which had kept down performance was the ever-increasing demand for a higher standard of comfort for passengers. Thus cubic space per passenger had been increased from the earlier standard of 20-30 cub. ft. per passenger to the present-day standard of 50 cub. ft. or more per passenger. Another factor which had retarded apparent progress in performance so far as British practice was concerned, was the adherence to a relatively low stalling speed. A vast amount of accumulated experience had shown that an aircraft with a stalling speed not far in excess of 50 m.p.h. could be taken off and landed with a high degree of safety under all normal conditions. Statements were often made that the evolution of commercial aircraft had advanced more rapidly in America and in certain European countries than in England. It was quite true that a number of American and Continental aircraft could claim a considerably higher cruising speed than the average standard of British types, but it should be remembered that these high cruising speeds had only been obtained at the sacrifice of some other quality. One of these was in the matter of stalling speed. With the advent of the multi-engined aircraft with four or more engines the risk of forced landing away from an organised aerodrome had been reduced, and it was probable that some increase in stalling speed could now be safely permitted. It was, however, unlikely that British aircraft designers would go as far in that direction as had some American and Continental designers.

Sir Eric stated that on the relatively short-distance European air routes high cruising speed had been of compara-

tively little importance during the first 10 years of air transport, but as British Imperial air lines extended across the Continent of Europe and then on to India or South Africa, the value of high cruising speed had increased, and to meet these new conditions the standard of cruising speed had increased and would be still further increased in the future, but always keeping stalling speed within safe limits.

Sir Eric Geddes touched briefly on the old controversy, biplane *v.* monoplane, and concluded that it could not be said that either monoplane or biplane construction had definitely established itself as generally superior. Each type had its particular advantages, and both types were likely to survive in commercial aircraft design for many years to come.

#### Regularity

It was, Sir Eric said, almost universally recognised that high regularity in transport was of relatively greater importance than high-speed services operated with intermittent degrees of regularity. He thought it was better to achieve 98 per cent. regularity on a six-day schedule to India than, say, 80 per cent. regularity on a 5½-day schedule.

Sir Eric then gave a table showing flights completed as a percentage of flights scheduled for the years 1925, 1926, 1927, 1928, 1929, 1930 :—

IMPERIAL AIRWAYS' REGULARITY (ALL SERVICES)					Flights completed as a Percentage of Flights scheduled. Per cent.
1925	..	..	..	..	75.0
1926	..	..	..	..	84.5
1927	..	..	..	..	92.0
1928	..	..	..	..	93.4
1929	..	..	..	..	93.4
1930	..	..	..	..	94.2



THE ARMSTRONG-WHITWORTH "ARGOSY" : Since 1926 this has been the machine to do most of Imperial Airways' landplane work. The engines are Armstrong-Siddeley "Jaguars." (FLIGHT Photo.)



**THE HANDLEY-PAGE "HANNIBAL":** Fitted with 4 Bristol "Jupiter" engines, this machine, which was designed to carry 42 passengers, is intended for the European and Cairo-Karachi sections of the Empire air routes next summer. (Flight Photo.)

Sir Eric pointed out that of the 15.5 per cent. of scheduled flights cancelled or abandoned in 1926, the causes were: bad weather, 8.5 per cent.; mechanical troubles, 2.3 per cent.; and consequential cancellations following previous incidents and cancellations of certain services for commercial reasons, 4.7 per cent. For 1930 the corresponding percentages were: bad weather, 3.3 per cent.; mechanical, 1.3 per cent.; and consequential cancellations, etc., 1.2 per cent.

He thought it could be assumed that one year's weather was little different from another year's, and the reduction from 8.5 to 3.3 per cent. in the bad-weather irregularities could be attributed mainly to the use of aircraft with ability to continue flight if one engine should cease to give its normal power. If some unforeseen trouble should occur in flight, a pilot on a multi-engined aircraft could continue to the next convenient aerodrome or carry on to his final destination. Thus, the forced landings of the past had become the voluntary or precautionary landings of to-day.

Mechanical incidents for last year were analysed into the following principal causes: engines, 56 per cent.; aircraft, 19 per cent.; installation, 25 per cent. It was seen that the aircraft structure was the least susceptible of the units of mechanical faults, the principal troubles being, as one would expect, the points of contact with the land (wheels and tail skid), and minor damage resulting from an occasional bad landing. The British standard of safety was the highest in the world, and British air-transport services had had 10 years' freedom from any flying accident due to the inherent weakness of any part of the aircraft structure.

The engine incidents were the result of material failures which occurred in spite of the thorough system of inspection under which all engine parts were constructed. Among the components in question were pistons, connecting rods, and

valves. Ignition defects, although of a minor nature, were a contributory cause.

The last group, installation, which accounted for 25 per cent. of the incidents, included the systems of oil and petrol piping, engine mountings, and propellers. This group was the Cinderella of aircraft. The engine-maker, naturally, concentrated most of his energies between those parts of the engine which lie between the carburettor intake and the exhaust ports. In the past there was a lack of co-operation between engine and aircraft makers, but there had been considerable improvement in the past few years. As an indication of the all-round improvement in mechanical reliability, Sir Eric pointed out that they were now getting three times as much mileage between flight cancellations as they were getting five years ago.

The progress in regularity would, he believed, be continued. Regularity had improved from 84½ per cent. in 1926 to 94.2 per cent. in 1930. On the Eastern section of the England-India route the regularity for the first year was 99.7 per cent., and for the first nine months of this year it was 100 per cent. They would, he was sure, increase the average regularity, but they would not do so on their long-distance routes by attempting to fly in exceptionally difficult and dangerous conditions. Elasticity must be provided in the time-table to allow for interruptions. Given the elasticity in the time-table, the service could arrive on schedule. It was, Sir Eric said, of interest to note in passing that while an air service endeavoured to adhere to a time-table giving scheduled times in hours and minutes, long-distance marine transport services still published arrival times as "afternoon" or "morning," a few hours one way or the other being considered as of no account.

(To be concluded)

#### Canadian Transcontinental Air Mail

THE Canadian Transcontinental Air Mail Service, by which mails between Montreal and Vancouver can be delivered within three days, has been successfully inaugurated.

#### New Australian Air Services

A NEW link in the chain of air routes connecting the metropolis and the country was forged last November when an all-metal Junkers monoplane, *Glorious Queensland*, of Sky Travel (Aust.), Ltd., inaugurated a weekly service between Brisbane and St. George, a distance of about 300 miles. The first trip, from Brisbane, was accomplished in 2 hr. 40 min., under by no means ideal flying conditions. By ordinary methods of transport the journey occupies about 27 hours.

Another service which may shortly be added to Australian air lines concerns, mainly, New South Wales. A general meeting of the Narromine Aero Club recently agreed to support the proposal to form a company, the Central Eastern Airways, to run air routes from Charleville and Narromine to Sydney (about 700 miles), and from Narromine via Coonamble, Moree, Tenterfield, Tamworth, and Mudgee back to Narromine. Members agreed to subscribe a substantial portion of the capital. Mr. T. E. Perry, president of the club, was appointed to the provisional board of directors. Much enthusiasm was shown, as the service would bring Narromine within two and a-half hours of Sydney. Narromine will be the country headquarters of the company.

#### Prompt Air Service in the West Indies

A GOOD story, with a distinctly American appeal, comes from the West Indies. It was a Friday, and a gala day in Kingston, Jamaica, with the consequence that the firm of H. M. Kalphat, agents for "Grouse" whisky, found themselves cleared out of stock at night. And Saturday is Saturday everywhere. Kalphat had supplies at Black River, a seaport town 100 miles west along the coast. There is no railway on this route, and cars would take at least five hours each way. Kalphat had the enterprise to get into touch with Caribbean Airways, Ltd., who hold a Government contract to operate the first and only air mail service in the West Indies. To a frantic inquiry for rates for guaranteed delivery of five cases by 8.30 a.m. in the morning, the laconic reply was: "Ordinary rates—so much a mile." Early in the morning, Captain Holland, Caribbean Airways' chief pilot, left Kingston in a Moth seaplane, breakfasted at Black River, and at 8.15 a.m. was back at Kingston delivering the whisky to Messrs. Kalphat's van. So the town was saved. Caribbean Airways report that this Moth is flying daily, carrying mails and passengers, giving piloting instruction, doing advertising flights for various films, and never gives a moment's trouble. As an indication of the faith placed in this Moth, the chairman of the company recently flew it over the mountains right across the island from south to north, attended to business 50 miles away, and was back in Kingston in time for 1 o'clock lunch—and the machine was fitted with floats!



# AIRPORT NEWS

## CROYDON WEEKLY NOTES

THE chief event of the week was the arrival of the new Fokker XII of the K.L.M. Co. of Holland, when Mr. Sillins demonstrated the machine. This machine is powered with three 425 h.p. "Wasp" engines. The usual Fokker design is followed, and beauty of finish and workmanship is very prominent as in all their previous types. The cockpit is totally enclosed, and the roomy cabin comfortably seats 16 passengers. Her speed is reputed to be 112 m.p.h. cruising, and 137 m.p.h. top. The take-off and climb are exceptionally good and there appears to be less noise than in the previous types. Each engine is fitted with an inertia starter which is operated by a portable starting handle. It requires at least two mechanics to obtain sufficient momentum to start each engine and another mechanic to do the actual starting. Owing to the great length of the starting handle there is an enormous amount of side play, which makes hard work in turning. The Jupiter method of starting with cartridges seems to be much safer, and also more labour-saving. The cockpit contains adjustable pilots' seats complete with dual controls, made of non-magnetic material so that there shall be no disturbing effect on the compass. The outboard engines are installed in a structure of welded steel tubes cowed with sheet aluminium. About 70 people were present as guests of the company, and a great many of them took advantage of an opportunity afforded them of taking a flight in the machine. After the demonstration the guests were taken to tea at the hotel, thence back to town. This is a good illustration of the businesslike methods of the K.L.M.—they believe in showing what they can do, not just talking about it.

Mr. Rogers, of Imperial Airways, arrived in Cairo with the second Argosy on February 2. It will be remembered he left Croydon a week before. He was unfortunate in running into some bad weather, near Dijon, whereby he lost about two days on the trip. A Westland Wessex arrived on Thursday, and was loaned to Imperial Airways. I believe this is on loan to them while their Westland IV is being converted. A certain wit passed the remark that a 40-seater had arrived at last, but was so anxious to get here that it lost the "0" on the way.

The old National Aircraft Factory recently occupied by the

late Aircraft Disposal Board, is up for sale by auction on March 10. It will be very interesting to watch results as to what the future industry of the place will be. It covers an enormous area, and would be admirably suitable for mass-production methods. Part of the factory has already been taken over by various industries, namely, wireless constructors, face cream manufacturers, etc. The Ministry of Labour have also acquired a large portion as a training centre for unemployed.

The weather during the week has been as good as could be expected, and services have run to schedule. On the 5th, however, the early inward freight machine of the Air Union got adrift, and finally landed on Shoreham aerodrome, but reached Croydon later in the day. By some means or other the daily press got hold of the story that the machine had crashed, but on learning that it was a perfectly normal landing, not to be daunted, they published a story about it in the following morning papers, with the usual amount of hot air that only they are capable of producing in such abundance. Why do they do it? Does it really interest the public so much?

The aerodrome immediately to the west of the Customs Area presents an awful sight. It is nothing more than a quagmire, and light aircraft would be well advised to keep clear—the Works and Buildings Department of the Air Ministry seem to delight in mud, digging holes and filling them in again.

I hear that our old friends, Mr. and Mrs. Jack Summerfield, of the "White Hart" hostelry at Hythe, are about to retire. I am sure that everyone at Croydon will be sorry that they are leaving, and will certainly join me in wishing them all good luck in the future. It is almost certain that every pilot and flight engineer of all the operating companies who have had to land at Lympne, always asked to stay at the "White Hart."

Mention of Lympne tempts me to ask who the gent is who has temporarily discarded his gauntlets and taken to wearing yards and yards of flannel?

The traffic figures for the week were:—

Passengers	..	..	..	..	232
Freight	..	..	..	..	24 tons

## HESTON AIR PARK

SIR CLAUD HILL, K.C.S.I., C.I.E., Governor of the Isle of Man, paid a visit to Heston Air Park on Friday, February 6. He is revolving plans for the establishment of an aerodrome on the Island, and his object in visiting Heston was to obtain from those responsible for its design and lay-out an account of their methods, with a view to gaining useful information.

A very attractive newcomer to Heston Air Park is the Comper Swift, whose smart appearance and beautiful finish have made everyone there covetous. This particular machine is painted green, and has been on view in Selfridge's for some time past and, fitted with a Salmson 40-h.p. engine, sells for £475.

The Cutty Sark, owned by Mr. Francis G. Francis, has been going through stirring times lately. A fortnight ago it was brought home to Heston by road from a small field near Dorking, in which Mr. Francis had been compelled to land it, owing to bad weather. After re-assembly, it set out on a voyage to the south of France, but the aerodrome at Lyons was so boggy that only after removing the luggage and sending it on by road could it be flown to Cannes.

Heston pupils are expressing great satisfaction with the "doughnut" wheels with which the Airwork School machines are being equipped, and of course the wear and tear on undercarriages caused by really bad landings is very much reduced, so that everyone is satisfied.

Gipsy II engines are being installed on the School machines; the object of this is twofold. First, that pupils who may, afterwards, purchase 1931 type machines can learn on that type, and second to reduce the time of taking off and of climb to a safe height.

Among those who are now taking lessons at Heston is Mr. Gerard D'Erlanger, who will be going solo very shortly. He is an excellent example in favour of the theory held by Capt. V. H. Baker, Chief Pilot of Airwork, Ltd., that people with brown eyes learn to fly with unusual rapidity. Their total time is not necessarily reduced, however, since it is often found that they experience more difficulty in learning to land. Once this is mastered they generally have no further difficulty, and their landings are often exceptionally neat.

An amusing history is attached to the Fokker machine G-AARG ("Old Jarge" as it is affectionately called at Heston), which was formerly in regular cross-Channel service. The company that owned it went into liquidation, and the machine was bought by Mr. R. J. Coley whose intention it was to break it up and dispose of the aluminium parts as scrap.

The reprieve arrived at the eleventh hour, however, for while Mr. Coley's men were actually on the way to carry out their work of destruction, three R.A.F. adventurous officers made Mr. Coley an offer and purchased the machine for £35. "Jarge" bravely took the air again at 12 noon on Friday, February 6, and gave an excellent account of himself.

A new map table has been placed in the lounge at Heston Air Park. The table is 6 ft. long and the top is covered with plate glass and consists of a 10-in. aviation map of the British Isles. Round the edge of the table are set out the points of the compass relative to Heston, so that the bearing of any desired destination can be instantly obtained by the use of a stretched string.

# AIRISMS FROM THE FOUR WINDS

## The Prince Flies Across Panama

AFTER the arrival of the *Oropesa* at Colon, on February 6, the Prince of Wales and Prince George flew across the isthmus to Panama, where they were received at the aerodrome at Paitilla Field by Major Braithwaite Wallis, the British Minister, Dr. Vallarino, the Panameño Foreign Secretary, Colonel Harry Burgess, Governor of the Canal Zone, Major-General Preston-Brown, and Rear-Admiral Hough, commanding the 15th U.S. Naval Division. They rejoined the *Oropesa*, which meanwhile had passed through the Canal, in the evening.

## R.A.F. Cairo-Cape Flight

THE three R.A.F. Vickers "Victoria" troop-carriers of No. 216 (Bomber) Squadron, under the command of Sqdn.-Ldr. H. W. G. J. Penderel, which set out from Cairo on January 12 on a 6,000-mile formation flight to Capetown, arrived there on February 7. The Governor-General of the Union, the Earl of Clarendon, accompanied by Lady Clarendon, unexpectedly welcomed them. Sqdn.-Ldr. Penderel said that the flight had been very successful. The planes had withstood continual drenching rain between Nairobi and Pretoria, and there had been one or two forced landings, but minor repairs were quickly carried out. Flying conditions in the Union had been perfect. The return flight commenced on February 11.

## R.A.F. Flight to Basra

THE three Short "Rangoon" flying-boats of No. 203 (Flying Boat) Squadron, R.A.F., which, as reported last week, are being flown out to Basra, where the Squadron is stationed, left Felixstowe on February 6. The three machines, which are under the command of Group Captain W. L. Welsh, took off at 10.50 a.m., and reached Calshot at 12.55 p.m. Here they were delayed by bad weather conditions.

## Business Plane's Dash to the Cape

EARLY on February 11, Flt.-Lieut. T. Rose, D.S.C., left Lympne on a lightning business trip, piloting the Anglo-American Oil Company's Avro-Avian machine *High Test* ("Cirrus Hermes"). This is one of a fleet of light aeroplanes used regularly in the company's service, but on this occasion it set out on a task of unusual magnitude. Flt.-Lieut. Rose is making this 7,000-mile dash in order to transact some important business in Cape Town. There is no question of an attack on the existing record for the journey, but it will be interesting from the business-man's point of view to see how quickly a properly-equipped light aeroplane can do the job without taking any undue risks.

## A Business Tour in Winter

HAVING a number of business calls to make throughout England, Mr. J. R. King, formerly of Brooklands and National Flying Services, has just completed a thousand-mile tour round England under severe winter conditions on his Robinson "Redwing." Appointments were made at various aerodromes and towns, and at no place was the machine more than 25 minutes late, and this should dispel any theories that business flying cannot be carried out in the winter. Places visited were—Brooklands, South Wales, Birmingham, Stoke-on-Trent, Liverpool, Manchester, up the West Coast

across to Leeds, Newcastle, Scarborough, Hull and back to Croydon. Bad weather prevailed throughout the trip; much fog, snow and sleet, including gales, and on three nights the "Redwing" was moored out in the open.

## The Long-distance Record

THE world's long-distance record for non-stop flight, measured in a straight line, at present stands to the credit of France, with a figure of 7,905.14 km. (approximately 4,900 miles), this distance having been flown by the French pilots Costes and Bellonte on a Breguet "Superbidon." This magnificent record is not likely to remain unassailed for long, and in fact attempts to beat it, so far unsuccessful on account of bad weather, have already been made. Three or four different French firms have built, or are building, machines designed especially for this record, all of them monoplanes. In the meantime we in this country are not losing sight of the record, although our chances of getting it are far less promising than they were a year or so ago. Had a new machine been put in hand at once, when the unfortunate mishap to Jones-Williams and Jenkins took place, we should probably be the holders of the record now. Delays have occurred, however, and although it appears now to be an open secret that the Fairey Aviation Co. is building a machine, the delay (for which that firm has not been responsible) will vastly increase our difficulties, as it seems likely that the French will give us another 1,000 miles or so to beat by the time the British machine is ready. This record, incidentally, is one of the few really worth-while records, since it is at the same time a test of the aerodynamic and structural efficiency of the aircraft and the reliability and fuel economy of the engine.

## Mrs. Victor Bruce

THE Hon. Mrs. Victor Bruce completed her world flight in her Blackburn "Bluebird" when she arrived at Glenn Curtis Airport, New York, last week. She is returning to Europe in the French liner *Ile-de-France*, with her aeroplane. She will fly from France to Croydon on February 20, escorted by Miss Winifred Spooner and other private owners, and will be received at Croydon by Mr. F. Montague, Under-Secretary of State for Air. Air attachés of the countries over which she flew will also be there to greet her. In the evening she will be entertained at dinner by the British Aviation Hospitality Committee and the Women's Automobile and Sports Association.

## The Italian Atlantic Squadron

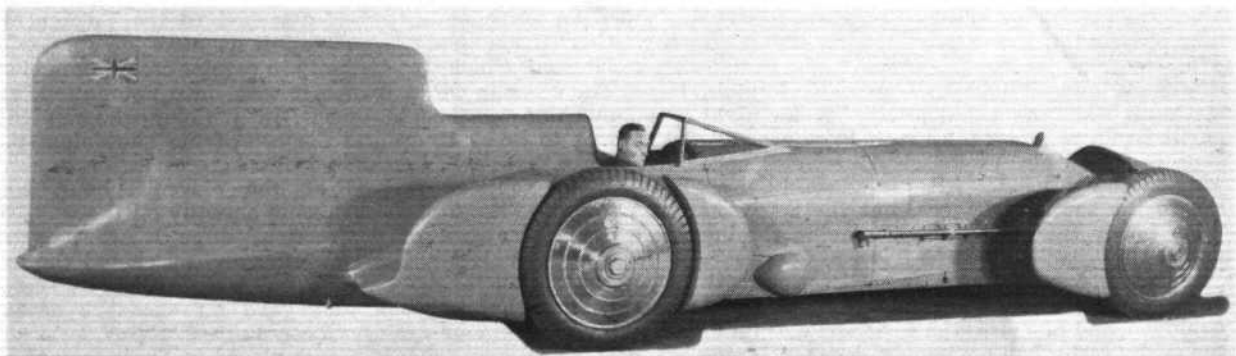
GENERAL BALBO and the other Italian aviators who took part in the recent formation flight across the Atlantic, left Rio de Janeiro on February 7 in the liner *Conte Rosso*. Major Donatelli, however, remained behind, as he is to instruct Brazilian airmen in the management of the eleven seaplanes which took part in the flight, and which have been acquired by the Brazilian Government.

## U.S. Airship "Los Angeles"

THE U.S. airship *Los Angeles* left Lakehurst, New Jersey, on February 4 for the military manoeuvres in Panama.

## Do. X Held Up

IT is reported that the accident to the Dornier flying-boat Do. X will delay her for a month at Las Palmas.



246-154 M.P.H.: "Blue Bird II," the car, designed by Mr. R. A. Railton and built by Thomson and Taylor of Brooklands, in which Captain Malcolm Campbell set up the world's record at Daytona. It is driven by a 1,350 h.p. special Napier aero engine, in which Hoffmann ball and roller bearings and K.L.G. plugs were employed. Parts of the mechanism of "Blue Bird II" were also made in the Precision Department of the Robinhood Engineering Works.



### The Schneider Team

SQUADRON-LEADER A. H. ORLEBAR, A.F.C., O.C., the Flying Boat Development Flight, has been appointed by the Air Ministry to take administrative charge of the British Schneider team. It is not intended that he shall be a flying member of the team, though, of course, he will be free to test machines at his own discretion. The time for making preparations for the contest is on the short side, and this being so, it behoves us to introduce as few unknown factors as possible. A very great deal hangs upon the personality of the officer who commands the team, and Orelebar has proved himself to possess all the desirable qualities in a very high degree. His experience of the varying conditions of the water in the Solent will also be very valuable to the committee in deciding upon the course for the next race. It is understood, though it has not been officially announced, that Calshot will again be the headquarters of the team. The flying members of the team have not yet been chosen. It may be taken that Waghorn, Atcherley, and D'Arcy Greig will not be considered—in fact, the last-named is flying a "Victoria" in the Cairo-Capetown flight. Stainfort might, however, be given a chance, as in 1929 it was his machine—and not he—which was unfit to take part in the race. Most of the experimental flying on the racing seaplanes has been done lately by Flight-Lieut. J. N. Boothman, and some by Flight-Lieuts. E. J. L. Hope and F. W. Long. Commander J. D. Bird has been elected chairman of the Schneider Trophy Committee, in place of Col. M. O'Gorman, who has resigned owing to pressure of work.

### The De Havilland Aeronautical Technical School Students' Ball

THE students of the de Havilland Aeronautical Technical School again held their annual ball in the Portman Rooms on Friday last, February 6 this year, with even greater success than last. Dancing commenced at 8.30 p.m., and continued until 2 a.m. At 10.30 p.m., Miss Valletta Yacopi and Miss Christine Grosvenor gave a voluntary cabaret. The former singing one or two songs, and the last named doing a Spanish dance in full costume and mantilla. The artistes were the recipients of large boxes of chocolates presented by the M.C. and Mrs. Eadon. There were approximately 450 guests and students present, including Capt. de Havilland, Mr. F. T. Hearle and Mr. C. C. Walker, directors of the de Havilland Aircraft Co., Ltd. The Air Ministry and Royal Air Force were also represented in large numbers, and other notable guests included Miss Winifred Spooner and Miss Aroha Clifford, the first New Zealand lady pilot. At midnight, Mrs. de Havilland distributed the prizes for the novelty dances, and also drew for the prizes which were given to the Lucky Ticket holders. To commemorate the occasion, Mrs. de Havilland presented ground engineers' licences to Mr. P. D. Wright, who was the first student to enter the Technical School, and also to Mr. Buck and Mr. Zdanowich. The vote of thanks to Mrs. de Havilland was proposed by Mr. C. E. Bridges, of the Middlesex Education Committee, which was given with musical honours. On behalf of the students, Mr. P. D. Wright presented Mrs. de Havilland with a large crystal fruit bowl as a memento of the occasion. The music was provided by Harry Morley's Portman Orchestra.

### The Popular Fokker

ON the occasion of the last Paris Aircraft Show, the French papers, *L'Air* and *L'Auto* arranged a competition for the visitors of the Show. The idea was to let the public decide which machine in their opinion, offered the greatest comfort and most conveniences to the passengers. They had to express their opinion by classifying the machines, and to award a number of points, with a maximum of 20. The result of this competition has now been made known, and the "Grand Prix de Comfort et d'Elégance d'Avions de Transport" has been awarded to the Fokker trimotor F. IX-Jupiter, which scored an average of 17½ points. Taking into consideration the large number of commercial machines exhibited, the result of this competition speaks well for the design, workmanship and finish of Fokker aircraft, and, moreover, for the high efficiency of H. P. Muttters & Son, The Hague, who supplied the cabin installation, to the order of the K.L.M., which company, true to its principles, does everything possible for the well-being of its passengers.

### A De Havilland Autogiro

THE de Havilland Aircraft Co., Ltd., are to collaborate with the Cierva Autogiro Co., Ltd., in the design of a new model of the Autogiro. The de Havilland Aircraft Co. has had considerable experience in designing and marketing light aircraft, and has, moreover, devoted much attention of late to the study of comfort for pilot and passengers. The experience gained in the design and operation of the Puss Moth

all-enclosed high-speed tourer is bound to be turned to account in the design of this new autogiro, which, in common with the Puss Moth, will be fitted with a 120-h.p. inverted type Gipsy III engine. If, as is hoped, the results of this combined work are satisfactory, the public will have yet another type of light aircraft from which to choose.

### For "Jupiter" Users

NUMBER 2 of the *Bristol Review* has just been issued, and like No. 1, it contains a large quantity of useful information about Bristol engine products, not only dealing with the engines themselves but also with many accessories and pieces of equipment for the various "Jupiter" engines. The new type of geared and moderately supercharged "Jupiter" X.F. BM is described, and recent innovations on the "F" types are dealt with. Data of the new range of "Mercury" engines are given, while the chapter dealing with recent factory developments at Bristol cannot fail to be of interest to all users of Bristol engines. The results of 100 hours' full-throttle type tests of the standard geared "Jupiter XI F." the "Jupiter IX F.," general purpose engine, and of the "Jupiter X.F. BM," cannot fail further to strengthen the reputation for reliability which the "Jupiters" already enjoy. The chapter devoted to the fuel economy of "Jupiter" engines will be found invaluable to all users, not least to commercial air-line companies. Of new accessories dealt with in the *Review*, mention may be made of the two types of gas starter incorporating combined cocks and switches for 3-engined and 4-engined aircraft, the automatic advance and retard unit for magnetos, the engine-driven gear box for auxiliary drives, and the automatic "Boost Control." The subjects contained in No. 2 of the *Bristol Review* are by no means exhausted with the list given above, but sufficient has, we think, been said to indicate that no one connected in any way with the operation and maintenance of Bristol engines can afford to miss this number. We gather that copies of the *Review* will be sent to any accredited person or firm making written application to the Bristol Company at Filton, Bristol.

### Foreign Orders for British Parachutes

THE recent success of British aircraft in foreign markets draws attention to the fact that British parachutes—among other accessories—are in increasing demand among European governments, sometimes as a direct result of the orders for British machines. When a foreign government decides that it will equip its air force with military types identical with those used by the Royal Air Force, it inevitably means buying our accessories, such as parachutes. In recent months the governments of Sweden, Norway, Finland, Belgium, Estonia and Greece have placed substantial orders for parachutes with the Irving Air Chute of Gt. Britain, Ltd. These orders are in addition to the work that the company has been doing for other European governments. Altogether, the foreign output of Irvin Air Chutes is now a large percentage of the total output.

### "Triplex" and Advertising

THE part played by advertising in building up a great new industry was described in an article in the February number of the *Advertising Display* by Mr. Reginald Delpech, founder and sales director of Triplex Safety Glass, Ltd. "The developments," Mr. Delpech writes, "were not just luck. They were the natural result of a long campaign. In 1912, when we began to create our markets, few people had thought of the possibilities of safety glass." Mr. Delpech began to educate them by advertising in such motoring papers as *The Auto*. "Triplex" is now fitted to enormous numbers of cars, and its use on aircraft is growing rapidly.

### Assistant Aeronautical Engineer Wanted

WE would draw attention to an advertisement appearing elsewhere in this issue regarding the vacancy for an assistant aeronautical engineer (civilian) in the Irish Free State Army Air Corps. Candidates under 45 years must have a Degree Diploma, or its equivalent in Engineering, an intimate knowledge of workshop practice, etc., and a knowledge of aerodynamics. Applications must be sent in before February 24. For full details we would refer our readers to the advertisement in question on page xxvii.

### Piston Ring Standards

TO assist designers of internal-combustion engines of all types, the British Piston Ring Co., Ltd., of Coventry, have prepared a very useful chart of Standard Piston Rings. Although these have been distributed to all the principal designers in this country, there are probably people interested who have not received one. We are asked to say that one of these charts—which are intended primarily for designers, consulting engineers, etc.—will be sent to anyone who applies to the British Piston Ring Co., Ltd., Holbrook Lane, Coventry.

## TRACK ASSEMBLY AT WESTLANDS

*In our issue of January 23, we published an article on track assembly of aircraft at the Blackburn works at Brough. In the article it was stated that this was probably the first aircraft firm to adopt this method of assembly. Apparently the West of England disputes this and claims that Yorkshire cannot claim this distinction, as the Westland Aircraft Works at Yeovil instituted a track system of assembly in 1928. Captain A. S. Keep of Westlands has sent us the following notes on the system used at Yeovil.—ED.*

UP to the present time over 400 Wapiti aircraft have been supplied to the British and Colonial Governments, and it is thought that a few notes on the general production methods in use would not be devoid of interest.

It was realised at an early stage in the production of these machines, that the methods which had proved satisfactory for wood and composite machines would require considerable revision if the satisfactory production of all-metal aircraft was to be obtained. Each component was therefore made the subject of careful operation-planning and time-study.

The substitution of metal for wood was effected without drastic changes in personnel. In fact, with few exceptions, all the workers previously employed on the manufacture of D.H.9A and other machines built by the Westland Aircraft Works, have been successfully transferred to the construction of the all-metal Wapiti.

All sub-assemblies are carefully jigged, and in the case of covered components, these jigs are mounted vertically. This practice is found to economise floor space and to speed up production considerably, owing to the greater facility with which jig setting, drilling and riveting operations can be carried out when the component, or unit, is at the most favourable height for the operator. The vertical assembly methods allow this height to be determined and fixed for each unit, whereas horizontal bench and trestle methods do not allow of such individual adjustments.

Fuselage assembly is divided into five main sub-assemblies, finally mated together on master jigs.

It is in the assembly and final erection of aircraft and aircraft components that production difficulties and delays are generally experienced, and, after due consideration, it was decided, late in 1928, to lay down fixed assembly lines, somewhat on the lines of those used in the Morris Cowley works at the same date; manual power being used instead of conveyor belts for moving units on to the next operation. The scheme has naturally undergone modification from time to time, as methods of improvements were made manifest, and at the present time three lines are in use.

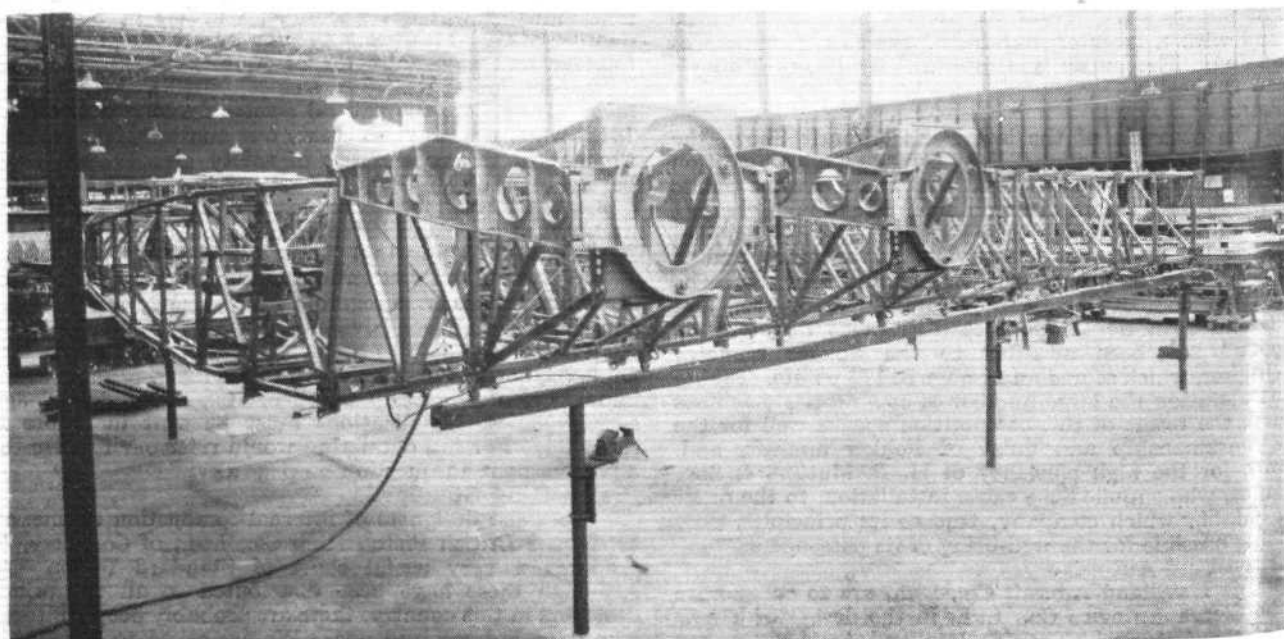
The fuselages leave the final fuselage assembly jig, and receive en route two coats of cellulose (sprayed on in a special jig, which allows of the fuselage being completely rotated

about its longitudinal axis, thus avoiding undue handling, and the possibility of defective work) are placed on the primary assembly line, which contains five stages. Here fuselages receive in turn flooring, tank bearers, main petrol tanks, control details, deckings, fairings and engine mountings. The feature of the last operation is massive locating jigs which ensure that every engine mounting is in exact alignment with the fuselage proper; this result is obtained without the mass of plumb lines and spirit levels frequently seen in aircraft shops. On this line, machines are moved laterally, the assembly line channels being specially spaced in such a way that the standard jacking and lifting fittings on the fuselage serve as a location for the fuselage on the line.

From this line fuselages are lifted by overhead tackle and run on a special trolley to the secondary assembly line, which is, perhaps, the most interesting of the three. This assembly line is nearly 100 ft. in length, and is capable of taking four Wapiti aircraft in series. On this line, the machines, in view of their weight, are dropped on to bogies, making it an easy matter for one man to move the machine along to each new station. Foot ramps are provided on each side of the line, so that trestles, ladders, etc., are rendered unnecessary. At the back of the line the details and parts required for each operation are arranged in racks, carrying one week's supply of all parts necessary. On this line, oil and auxiliary petrol tanks, controls, engine controls, fireproof bulkheads, tail skids, etc., are fitted, and at the end of the line the nose of the machine is picked up on a special tripod and the undercarriage fitted.

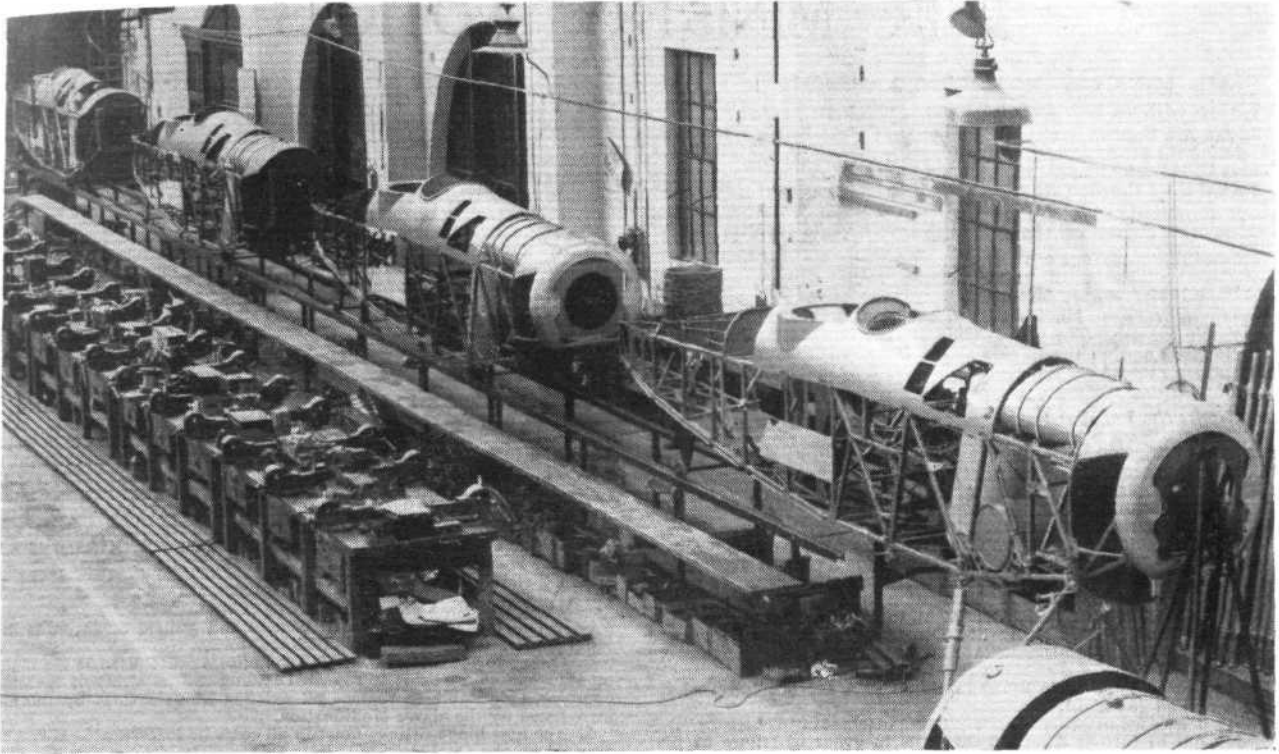
Like the line previously described, compressed air pipe lines are provided throughout the whole length; with feed pipes at frequent intervals for the use of pneumatic drilling and riveting tools. From this line, the undercarriage having been attached (less wheels), machines are swung over to the final erecting line, which is placed at right-angles to the previous one. This line was originally arranged with a track way, along which machines could be moved laterally. It was found that this did not give sufficient mobility, and the track way has, in this case, since been superseded by a special system of castor-wheeled trolleys which replace the landing wheels. This, in conjunction with a similar trolley under the tail skid, not only makes it possible for the machine to be moved laterally every 10 hours to take up its new station, but enables the machine also to be moved out of the assembly line if necessary and traverse, not only backwards and forwards, but at any required angle to its axis, the castor wheels having a full 360 deg. movement. This assembly line is fitted with overhead travelling gear for the last installation, and if necessary, removal of engines.

At the end of this line is a dope-spraying booth fitted with extractor fans and heating pipes, thus avoiding the necessity



**TRACK ASSEMBLY AT YEOVIL:** This Photograph shows the Primary Assembly Line. Note the Engine Mountings on the nearest two Fuselages.





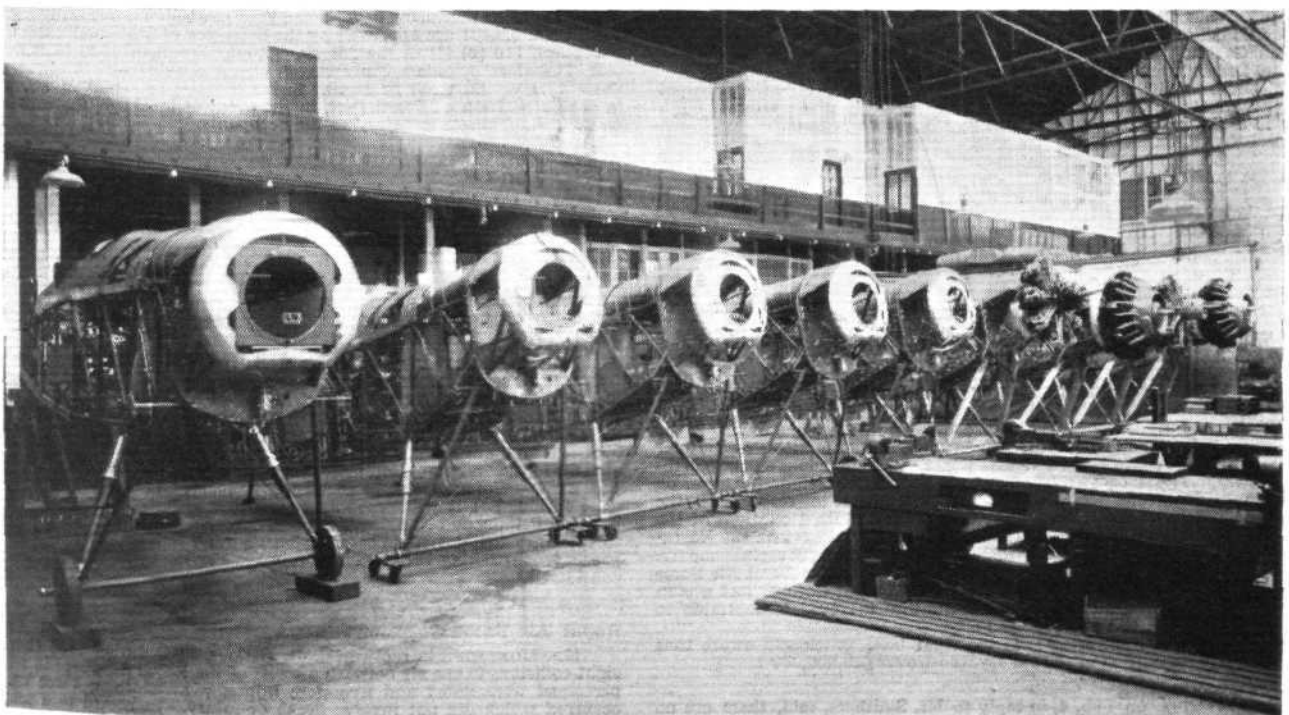
**THE SECONDARY ASSEMBLY LINE:** In this, which is 100 ft. long, there is room for four "Wapiti" Fuselages.

for taking the machine to the dope shop and back again to the erecting shop. Machines leave this line with engines fitted, fuselage covered, doped and varnished, and centre section fitted, leaving only the covered units and wheels to be fitted before flight test and despatch.

No attempt has been made to cut down the number of stages required. The three assembly lines described contain in all 19 stages. It is considered that, within reason, the smaller the number of men on a machine at any given station, the higher the efficiency at which their particular operations can be carried out.

It will be noted from the photographs that small vices are fitted at intervals along the assembly lines, thus rendering it unnecessary for the operators to leave their particular stations.

It has been found that the application on a small scale of mass production principles have not only speeded up output very considerably, but has tended to increase the accuracy and general standard of the product; as, in order to ensure harmonious working of the whole plant free from breakdowns, shortages and errors, due to hand work, jiggling has been carried out to a much greater extent than is normally met with in aircraft produced in moderate quantities.



**THE FINAL ASSEMBLY LINE:** Small castor wheels are fitted on the axles to enable the machines to be moved sideways or forward.

# AIR MINISTRY NOTICES

## AIR MINISTRY NOTICES TO AIRMEN

### Night Flying without Navigation Lights

1. ROYAL AIR FORCE aircraft will be flying at night between 18.00 and 22.00 hr. during the period from January 26, 1931, to May 17, 1931, inclusive, over an area bounded by straight lines joining Chelsfield, Addington (approximately 4 miles E. of Croydon air port), Oxted, Sevenoaks, and Chelsfield.

2. Above an altitude of 5,000 ft., the aircraft will not exhibit navigation lights, unless other aircraft are observed in their immediate vicinity.

(Navigational Warning No. 1 of 1931)

### Burma : Rangoon Landing Ground

A GOVERNMENT-OWNED landing ground has been established at Rangoon and is available for use. The new landing ground is situated 8½ miles N. by W. of Rangoon and on the E. side of the Rangoon-Prome main road.

The Kyaikasan racecourse, Rangoon, is no longer available for use by aircraft.

(General Notice No. 1 of 1931.)

### A.—The Air Navigation Directions, 1930 (A.N.D. 10)

### B.—The Air Navigation (Amendment) (No. 2) Order, 1930

### C.—The Air Navigation (Amendment) (No. 3) Order, 1930

#### A.—The Air Navigation Directions, 1930 (A.N.D. 10)

1. ATTENTION is drawn to the publication of the Air Navigation Directions, 1930 (A.N.D. 10), copies of which are obtainable direct from H.M. Stationery Office, or through any bookseller, price 6d. net.

2. The new Directions replace the Air Navigation Directions, 1928 (A.N.D. 7), the Air Navigation Directions, 1929 (A.N.D. 7A), the Air Navigation Directions 1929 (A.N.D. 7B), and the Air Navigation Directions, 1930 (A.N.D. 7C), and incorporate, in addition, amendments affecting *inter alia* the following matters:—

- (i) Pilot's licence for private flying machines ("A Licence").—Test for altitude and gliding flight.
- (ii) Pilot's licence for passenger or goods flying machines ("B Licence").—Carrying out of further official flying tests in event of failure at first attempt. Fees payable in respect of such further tests.
- (iii) The dropping from aircraft in flight of smoke producing or other apparatus for the purpose of navigating the aircraft and of message bags, etc.
- (iv) The provision in all flying machines, for all flights, of safety belts for pilots, whether carried in an open cockpit or not.

#### B.—The Air Navigation (Amendment) (No. 2) Order, 1930.

1. An Order in Council, entitled "The Air Navigation (Amendment) (No. 2) Order, 1930," has been established further amending the Air Navigation (Consolidation) Order, 1923, as amended by the various subsequent Air Navigation (Amendment) Orders. The new Order, which came into operation provisionally as from November 27, 1930, will, when established as a Final Order, be published in the S.R. & O. series.

2. The Order provides, *inter alia*, for the insertion of the following new paragraph after paragraph 7 of Schedule V of the principal Order:—

"7A. A member of the operative crew of a passenger or goods flying machine of any type, who is manoeuvring the machine under the direct supervision of the pilot thereof, shall be deemed to be the holder of a licence in respect of the capacity in which he is so acting, if he holds a pilot's licence, granted or rendered valid under the provisions of this order, to fly passenger or goods flying machines of that or some other type.

"In this paragraph the expression 'passenger or goods flying machine' means a flying machine carrying passengers or goods for hire or reward or being flown for any industrial purpose."

#### C.—The Air Navigation (Amendment) (No. 3) Order, 1930.

1. An Order in Council entitled "The Air Navigation (Amendment) (No. 3) Order, 1930" has also been established. This order, which came into operation provisionally as from December 18, 1930, was published in the issue of the "London Gazette" dated December 30, 1930, and will, when established as a Final Order, be published in the S.R. & O. series.

2. The Order provides for the amendment of Schedule VIII to the principal Order and affects the Customs rules for the departure of an aircraft on a voyage to a place outside Great Britain and Northern Ireland.

(General Notice No. 2 of 1931.)

## AIR MINISTRY NOTICES TO AIRCRAFT OWNERS AND GROUND ENGINEERS

### Marconi-Newton Constant Speed Windmills

1. WHEN Marconi-Newton Constant Speed Windmills of any of the approved types, i.e., types 110, 140, 160 and 180, are employed for driving aircraft generators installed on aircraft flying with a Certificate of Airworthiness, it is essential that the following instructions be observed to ensure the correct functioning of their regulating mechanism.

2. The windmills are to be tested before each flight for freedom of the blades. For this purpose the blades are to be turned against the force of the internal springs in the direction to coarsen their pitch, care being taken that the blades are gripped as near as possible to the centre to avoid damaging or distorting the blades.

3. The windmills are to be lubricated after approximately every 20 hours, flying by means of a few drops only of very light machine oil introduced into the hole provided.

(No. 1 of 1931.)

### Blackburn Bluebird Mk. IV Aircraft : Top Longerons Fitting

1. CASES have occurred of the fitting Part No. N.D. 134, cracking along the bend lines. This fitting is situated on the after side of the fireproof bulkhead and forms the top longeron joint on both port and starboard sides.

2. These joints should, therefore, be inspected immediately for signs of cracks, and further inspection should be carried out at frequent intervals.

3. An improved design of fitting, Part No. S.K. 3443, has been produced by The Blackburn Aeroplane and Motor Company, Brough, East Yorkshire.

4. In the event of failure being detected, Part S.K. 3443 should be substituted for Part N.D. 134.

(No. 2 of 1931.)

### Westland Widgeon Aircraft : Wing Hinge Joints

1. THE attention of aircraft owners and ground engineers is drawn to Modification Widgeon/13, Wing Hinge Joints.

2. Owing to the distortion which sometimes takes place at the hinge joints on Widgeon aircraft due to repeated folding and assembly of the wings, it is considered desirable to replace all existing hinge fittings by the new type introduced by the above Modification.

3. The new hinge fittings must in all cases be incorporated before the next renewal of the Certificate of Airworthiness. In cases where the hinges are already distorted or the attachment bolts are bent, the modification must be introduced immediately.

4. The necessary new parts can be obtained on application to Messrs. Westland Aircraft Works, Yeovil.

(No. 16 of 1931)

### Approved Aircrew Designs

A SERIES of Notices have been issued by the Air Ministry, giving in detail the aircrew designs approved for various aircraft. These embrace Notices numbered from No. 3 of 1931 to No. 15 of 1931, both inclusive.

In each case are given the diameter and pitch in feet with various engines.

No. 3 relates to Avian III with Cirrus II and Cirrus III engines.

No. 4 relates to Avian II, with the same engines.

No. 5 relates to Avian IIIA, with Genet II and IIA and Cirrus II and III.

No. 6 relates to Avian IV, with Cirrus II and III, Genet II and IIA, Genet Major and Hermes I.

No. 7 relates to Avian monoplane, with Genet Major and Hermes I.

No. 8 relates to Avro V, with Genet Major.

No. 9 relates to Bluebird IV, with Cirrus III, Gipsy I and II, and Hermes.

No. 10 relates to Moth D.H. 60X, with Cirrus II and III.

No. 11 relates to D.H. 60 H, with Cirrus III, Gipsy I and II.

No. 12 relates to Moth D.H. 60 G, with Gipsy I and II.

No. 13 relates to Puss Moth D.H. 80 A, with Gipsy III.

No. 14 relates to Simmonds Spartan, with Cirrus III, Hermes, Gipsy I and II.

No. 15 relates to Westland Widgeon, with Cirrus II and Genet II.

All the above are obtainable upon application to the Air Ministry.

### "Armour" Wind Direction Indicator

1. The smoke producing devices and their method of use described in letters patent No. 326161 are approved by the Secretary of State under the terms of paragraph 119 (b) (1) of the Air Navigation Directions 1930 (A.N.D. 10).

2. The glass cylinders containing a chemical substance, forming part of these devices, must not be carried inside cockpits or cabins of aircraft, nor in such a position on board that, in the event of breakage, the contents will cause inconvenience or injury to the occupants.

(No. 17 of 1931.)

## IN PARLIAMENT

### North-West Frontier of India

MAJOR-GENERAL SIR ALFRED KNOX, on February 2, asked the Secretary of State for India if he would take steps to remedy the present system of divided command between the military and Air Force on the North-West Frontier of India?

The Secretary of State for India (Mr. Wedgwood Benn): On January 11 the Government of India announced the appointment of a Committee to consider the system of tribal control and defence against tribal incursions on the North-West Frontier. The terms of reference of the Committee include the question whether any departure from existing arrangements in respect of the strength, disposition, organisation, co-ordination and mutual relations of the Royal Air Force, the Regular troops and the armed civil forces on the North-West Frontier is advisable in order to increase efficiency and promote economy. It is estimated that the cost of bombs thrown by air by the Royal Air Force during the period of active operations between May and October last was in the neighbourhood of £160,000. The expenditure involved is debitable to Military Estimates, Part C, Royal Air Force.

Lieut.-Commander Kenworthy: Is the right hon. gentleman aware that the last military expedition in the old style cost over £20,000,000?

### Aerodromes, Moray and Elgin

MR. MONTAGUE, on Feb. 4, in reply to Mr. Smithers, said, there are no service or licensed civil aerodromes or landing grounds in the county of Moray or Elgin, maintenance of which entails any cost to the State. There are, however, in this county as in others, areas available for use for individual flights by arrangement with the owners on payment of a small charge on each occasion of such user.

### Air Services in the Far East

MR. MONTAGUE, in reply to Mr. L'Estrange Malone, said, an agreement was signed a few months ago between the Chinese Government and the Deutsche Lufthansa for the establishment of a Berlin-Nanking air service, and a Sino-German air traffic company is about to be formed which will be financed both by the Chinese Government and the Lufthansa. The air service between Berlin and Shanghai, via Nanking, is to be confined to the carriage of mails in the first place, but later may be used for the transport of passengers. The Berlin-Peiping section of the route is expected to be in operation during next spring, but it will probably be another year before a regular service between Peiping and Nanking is in operation. An air expert has been attached to the United States trade commissioner's office in Shanghai; and any proposals for furthering British aviation in the Far East will be sympathetically considered.

### Royal Air Force Collisions

MR. MONTAGUE in reply to Capt. Balfour, said, during 1930 there were eight collisions in the air between aircraft of the Royal Air Force in which 10 personnel were killed and five were injured; in addition, three collisions occurred which did not involve death or injury. In regard to a restricted field of vision being a predominating cause of collisions, this is not borne out by the facts. At the same time the necessity of securing to the pilot the best possible field of view is always regarded as a most important factor in the design of aircraft. We demand the very highest standard, having regard to the design of the aircraft and the purpose for which it is used.



# THE ROYAL AIR FORCE

London Gazette, February 3, 1931.

## General Duties Branch

Flight Cadet W. T. H. Nichols having successfully passed through the R.A.F. College, Cranwell, is granted a permanent comm. as Pilot Officer with effect from and with seny. of Dec. 20, 1930; Lt. A. M. Kimmins R.N., is reattached to R.A.F. as Flight Lt. with effect from Nov. 22, 1930, and with seny. of July 1, 1927 (substituted for *Gazette* Dec. 2, 1930). The following Pilot Officers on probation are confirmed in rank: J. K. Brew (Jan. 4); R. V. Alexander, J. Boston, H. M. Bowes-Lyon, E. J. P. Davy, B. E. Lowe, J. C. Mansfield, U. Y. Shannon, R. M. Smith, J. B. T. Whitehead (Feb. 3). Wing-Commander C. G. S. Gould is placed on half-pay list, scale A (Jan. 29); Pilot Officer on probation W. G. Eatherley relinquishes his short service comm. on account of ill-health (Feb. 4).

The short service comm. of the undermentioned Pilot Officers on probation are terminated on cessation of duty (Feb. 4):—D. J. Bateman, E. C. Van Oppen.

Flying Officer A. O. Simpson (Lt. R.A.) relinquishes his tem. comm. on return to Army duty (Dec. 9, 1930); (Substituted for *Gazette*, Dec. 19, 1930). Flying Officer E. A. Airy (Lt., The Buffs) relinquishes his tem. comm. on return to Army duty (Dec. 18, 1930); (Substituted for *Gazette* Jan. 2) *Gazette* Nov. 4, 1930, concerning Squadron Leader T. P. Y. Moore is cancelled.

## Stores Branch

The following Pilot Officers on probation are confirmed in rank and promoted to rank of Flying Officer (Jan. 10):—B. S. Cartmel, L. Llewellyn, E. N. Lowe, F. C. Read, J. W. C. Revill.

## Medical Branch

Flying Officer A. E. Nawser, L.M.S.S.A., is promoted to rank of Flight-Lieutenant (Feb. 1). The following Flight Lieutenants are transferred to

Reserve, Class D (ii) (Feb. 2):—R. F. MacLachy, M.D., C.M., J. J. Quinlan M.B., B.Ch.

## Dental Branch

The following are granted non-permanent commns. as Flying Officers with effect from and with seny. of the dates stated:—J. G. Stewart, L.D.S. (Jan. 19); J. J. Lawson, L.D.S. (Jan. 21).

## RESERVE OF AIR FORCE OFFICERS

### General Duties Branch

C. N. Shaw is granted a comm. in Special Reserve as Pilot Officer on probation (Dec. 17, 1930). The following Flying Officers are promoted to rank of Flight Lt. (Feb. 4):—E. D. Cummings, D.F.C., H. W. Allen, E. J. Ellis, F. S. Homersham, D.C.M., M.M., D. S. Green, R. L. Burnett, P. G. Tweedie, W. E. Barnes, H. G. Loch.

The following Flying Officers are transferred from Class C to Class A:—W. N. L. Cope (Dec. 30, 1930); R. Beresford (Jan. 17); Flight Lt. H. G. P. Rees is transferred from Class B to Class C (Oct. 30, 1930);—Flying Officer J. H. A. Wells relinquishes his comm. on completion of service (Jan. 18); the comm. of Pilot Officer on probation E. P. Kenrick, is terminated on cessation of duty (Jan. 15).

## AUXILIARY AIR FORCE

### General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—Pilot Officer the Hon. G. R. Ward is promoted to the rank of Flying Officer (Dec. 27, 1930).

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

### General Duties Branch

*Air Commodore:* R. P. Ross, D.S.O., A.F.C., to H.Q., R.A.F., Middle East, Cairo, for duty as Chief Staff Officer, 23.1.31.

*Wing Commanders:* C. G. S. Gould, to Half-pay List, 29.1.31. W. V. Strugnell, M.C., to Home Aircraft Depot, Henlow, for Administrative duties, 10.1.31. V. S. Brown, to Home Aircraft Depot, Henlow, for Engineer duties, 19.1.31. F. P. Don, to Cambridge University Air Sqdn., for duty as Chief Instructor, 19.1.31.

*Squadron Leaders:* T. W. Elsdon, to H.M.S. *Courageous*, 24.1.31. L. M. Bailey, A.F.C., to H.Q., Coastal Area, 30.1.31. P. B. Hunter, to No. 26 Sqdn, Catterick, 21.1.31. T. C. Luke, M.C., to Station Flight, Andover, 23.1.31. R. J. Sanceau, to No. 99 Sqdn., Upper Heyford, 26.1.31.

*Flight Lieutenants:* R. J. Divers, M.B.E., to No. 5 Flying Training School, Sealand, 26.1.31. C. A. Horn, to No. 1 Sch. of Tech. Training (Apprentices), Halton, 2.2.31. J. F. A. Day, A.F.C., to No. 33 Sqdn., Bicester, 21.1.31. T. A. Warne-Brown, D.S.C., to Sch. of Tech. Training (Men), Manston, 22.1.31. F. M. V. May, to No. 5 Flying Training Sch., Sealand, 22.1.31. J. Harston, to No. 2 Flying Training Sch., Digby, 25.1.31. J. McFarlane, M.C., A.F.C., to Sch. of Naval Co-operation, Lee-on-Solent, 25.1.31. (Hon. Sq.-Ldr.) V. D. O'Malley, M.C., to H.Q., Iraq Command, Hinaidi, 23.1.31. C. P. Brown, D.F.C., to No. 13 Sqdn., Netheravon, 1.2.31. C. R. Hancock, to R.A.F. Depot, Uxbridge, 11.12.30. J. F. Griffiths, to No. 31 Sqdn., Quetta, 6.1.31. A. E. Bellby, to No. 100 Sqdn., Donibristle, 3.2.31. R. A. Whyte, to Station H.Q., Andover, 26.1.31.

*Flying Officers:* C. E. V. L'E. Feasey, to No. 15 Sqdn., Martlesham Heath, 27.1.31. J. P. Hinks, to Station H.Q., Duxford, 2.2.31. R. F. Shenton, to Sch. of Naval Co-operation, Lee-on-Solent, 30.1.31. K. E. Parker, to Station H.Q., Hal Far, Malta, 3.1.31. R. F. Gandy, to No. 43 Sqdn., Tangmere, 30.1.31.

*Pilot Officers:* W. T. H. Nichols, to No. 16 Sqdn., Old Sarum, on appointment to a Permanent Comm. from the R.A.F. College, Cranwell, 20.12.30.

E. R. Simonds, to No. 4 Flying Training Sch., Abu Sueir, 24.1.31. R. W. H. Rayneau, to No. 1 Sqdn., Tangmere, 29.1.31.

### Stores Branch

*Squadron Leader* W. A. Kingston, to Armament and Gunnery Sch., Eastchurch, 27.1.31.

*Flight Lieutenants:* W. A. O. Honey, to H.Q., R.A.F., Cranwell, 26.1.31. T. G. Bowler, to Air Ministry (D. of E.), 19.1.31.

*Flying Officers:* F. W. Felgate, to No. 3 Stores Depot Milton, 27.1.31. H. D. Jackman, to Station H.Q., Boscombe Down, 19.1.31.

### Accountant Branch

*Squadron Leader:* F. W. Arthurton, to No. 3 Flying Training Sch., Grantham, 28.1.31.

*Flight Lieutenant:* D. J. Sherlock, to R.A.F. Base, Calshot, 14.1.31.

### Medical Branch

*Group Captain:* A. V. J. Richardson, O.B.E., to H.Q., Coastal Area, for duty as Principal Med. Officer, 2.2.31.

*Wing Commander:* R. S. Overton, to No. 21 Group H.Q., West Drayton, 5.2.31.

*Flight Lieutenant:* F. L. White, to Station H.Q., Heliopolis, 8.1.31.

### Dental Branch

*Flying Officer:* C. M. Leckie, to Station H.Q., North Weald, 6.2.31.

### Chaplain's Branch

Revd. A. W. Brown, to Station H.Q., Manston, 10.1.31.

## NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on February 6:—*Lieuts. (F.O., R.A.F.)*—A. A. Murray, to *Victory* (Feb. 17) and R. H. S. Roundell, to *Cornwall*.

## R.A.F. SPORT

### ASSOCIATION FOOTBALL

#### R.A.F. v. F.A. Amateur XI

ON Wednesday, January 28, the F.A. Amateur XI beat the Royal Air Force at Uxbridge by 5 goals to 3. The game did not show very high class play, but there were dramatic moments. Once G. J. Webb, the F.A. centre-forward scored three goals in less than two minutes. Then Corpl. Robinson, the centre half of the R.A.F. shot a goal from about midfield. The other R.A.F. goals were scored by L. A/C. Vernon and Robinson. The teams were:

*R.A.F.*—A/C. Chaston (Uxbridge); Col. Pond (Henlow), Sgt. James Bulmer (Lee-on-Solent); A/C. Parrish (Kenley), Sgt. Sadler (Coastal Area H.); L. A/C. Vernon (Halton), L. A. Knight (Marston), A/C. Hickey (Uxbridge). *F.A. XI*—S. R. Smith (Hampstead); J. R. Turnbull (Bank of England), Sgt. Lyon (Royal Navy), J. Stimson (Epsom Town), D. S. Woodbridge (Old Lyonians), J. W. Stannard (Barking Town); H. M. Marchant (Leyton), J. Lewis (Walthamstow Avenue), G. J. Webb (Romford), F. Macey (Kingstonians), L. Finch (Barnet).

### HOCKEY

#### Oxford University v. R.A.F.

OXFORD beat the R.A.F. at Stanmore, on Wednesday, January 28, by 6-1. It was a good game, and the scores would probably have been more even had the R.A.F. goalkeeper not had an off day. Pilot Officer N. Hill, who played left half for the R.A.F., proved a great find, and put up a great defence against a wing composed of international players. The one R.A.F. goal was scored by F.O. H. E. Jubs. The teams were:—*Oxford University*—G. E. Pittwood (Jesus); M. L. Docker (Oriel), P. F. Garthwaite (Brasenose); J. M. Monkhouse (Trinity), G. Theophilus (University), H. J. Linnell (Trinity); T. L. Jones (Brasenose), T. J. R. Dashwood (Brasenose), D. G. Oswald (Wadham), J. S. M. Paul (St. John's), F. I. Cox (Jesus).

*Royal Air Force*—Cpl. C. Butler (Stanmore); Cpl. L. G. Beeton (Henlow), Sgt. N. Z. Foreman (North Weald); Pilot Officer N. Hill (Bircham Newton),

Sergt. W. C. Maher (Upavon), L. A/C. L. R. Hobbs (Uxbridge); L. A/C. C. G. Stevenson (Henlow), Flying Officer S. C. Bufton (Sealand), Flying Officer H. E. Sales (Bicester), Flight-Lieut. H. N. Hampton (Andover), Flying Officer D. P. Lascelles (Sealand).

## RUGBY FOOTBALL

### R.A.F. v. Cambridge University

ON Wednesday, January 21, the R.A.F. XV drew with Cambridge at Halton, each side scoring two goals and three tries (19 points). A most exciting game, in which each side in turn seemed certain to win. First, George Beamish scored for the R.A.F. and Simmons converted. Then Adams got over for Cambridge, and the goal was kicked to make the scores even. Tallent added a try for Cambridge, but the R.A.F. went ahead, when tries were scored by Hodder, White and Buder, the first being converted. Then Simpson and Ringdahl both scored for Cambridge, and one goal was kicked. Maclean added the last R.A.F. try. In the last few minutes Johnstone, the light blue forward, scored between the posts and put the scores even. Askew's kick at goal was charged down by Simmons.

The teams were:—

*Cambridge University*—J. G. Askew, back; P. T. Sinker, G. C. A. Adams, J. A. Tallent, and N. T. Ringdahl, three-quarter backs; R. W. Owen and F. W. Simpson, half-backs; D. M. Marr, P. W. P. Brook, A. R. Ramsay, H. B. L. Johnstone, G. E. Valentine, J. G. Watherston, A. C. Lusty, and W. H. Leather, forwards.

*Royal Air Force*—Pilot Officer G. M. Ievers, back; Pilot Officer G. P. White, Pilot Officer G. R. A. Elmsie, Flight-Lieut. D. S. Hodder and Flight-Lieut. G. P. Harvey, three-quarter backs; Flight Officer B. Bader and Flight Officer P. L. Maclean, half-backs; Aircraftman J. Monkley, Sergt. A. C. Hall, Leading Aircraftman A. E. Simmons, Flight Officer H. L. Patch, Corpl. Christie, Pilot Officer W. N. McKechnie, Flight-Lieut. G. R. Beamish and Flight-Sergt. P. Kirby, forwards.

## MODELS

### THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS (S.M.A.E.)

**Competitions for 1931.**—Members of the S.M.A.E. and affiliated clubs, or anyone interested in the coming season's competitions, are reminded that any correspondence in connection with the same should be sent direct to the Competition Secretary of the S.M.A.E., Mr. J. Van Hattum, "Cloverlands," 18, Stag Lane, Edgware, Middlesex.

Particulars and dates of all competitions will be published well in advance, but Mr. Van Hattum (who was appointed Competition Secretary at the annual general meeting in January this year) will be pleased to answer any correspondence from intending competitors who wish for any further information.—S. G. Mullins, Hon. Sec., the S.M.A.E., 72, Westminster Avenue, Thornton Heath, Surrey.

### THE MODEL AIRCRAFT CLUB (T.M.A.C.)

**Manchester Squadron No. 51.**—All aeromodellists in this district are invited to get into touch with Mr. J. W. Kenworthy, New Barnes Farm, Barlow Moor Road, West Didsbury, Manchester, and will be welcome at the flying meetings held at the flying ground, Princess Road, Wilkington, every Sunday morning at 11 a.m.; opening meeting February 22, 1931.

**Coventry Squadron No. 9.**—Will all Modellists in the district who are interested in model aircraft please get in touch with Mr. M. Pemberton, Y.M.C.A., Coventry.

**Bunker's Hill, Squadron No. 1.**—The inaugural meeting will be held on Sunday next, February 15, under the leadership of Mr. W. R. Burnett, nearest station, Golders Green, Under-round.

**4th Wing, T.M.A.C., Hackney Marsh.**—Sixteen members were present on Sunday, February 8, with 16 fuselage models, and several hours' instructive practice was obtained.

The air was lifeless at first, but the wind freshening, some really fine high flights were achieved. Mr. Batchelor's low-wing, Mr. Wood's high-wing "Dracula," and Messrs. J. and D. Beard's two high-wing Tomtits were deserving of special mention.

In the eleven weeks that 4th Wing has been operating, attendance has been highly satisfactory. Very noticeable progress has been made, and the arrival of good flying weather should find quite a number of members in a position to give a good account of themselves in Inter-Wing Contests.

**Indoor Flying Meetings.**—Will members please take notice of the following dates:—February 18, 25, March 12, 18, 25, at the Royal Horticultural Hall, Vincent Square, S.W. 1.

**T.M.A.C. and Sailplane Clubs' Dance.**—March 7. Tickets 2s. 6d. Held at the Suffolk Galleries, Pall Mall, S.W., A. E. Jones, hon. sec., 48, Narcissus Road, West Hampstead, N.W. 6.

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### CONSTRUCTOR'S SPECIAL NOTICE

#### De Havilland Notice to Owners and Operators of "Gipsy" engines I, II and III

**Impulse Starters Fitted to B.T.-H. AG4-4 Magnetos on all "Gipsy" Engines.**—A few cases have been reported of defect developing in these impulse starters during running.

Arrangements have been made with the makers for the supply of an improved type of impulse starter. These will be supplied free of charge by the de Havilland Aircraft Co., Ltd., upon receipt of the old type starter. In any case, a new type starter should be fitted to the magneto when the engine is undergoing a complete overhaul.

These notes do not refer to the impulse starter fitted to B.T.-H. AG4-2 type magneto. "Gipsy I" engines have been fitted with both AG4-2 and AG4-4 type magnetos, but "Gipsy II" and "III" engines are fitted with AG4-4 type.

The old type of impulse starter is marked either "Vertical," "Inverted," or "L2B." The improved type is marked "L2B-II."

No. 7. January 29, 1931.

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#### Gloster and Cheltenham Branch, R.Ae.S.

The following lectures, etc., will be delivered before the Gloster and Cheltenham branch of the Royal Aeronautical Society:—

Feb. 12 Meeting for Prospective Ground Engineer Candidates.

Feb. 19 "Heat-Treatment of Steels." Mr. A. L. Williams.

Feb. 26 "Motor Fuels and Modern Methods of Testing," Anglo-American Oil Co., Ltd.

Mar. 5 "Mechanical Testing of Aircraft Materials," Mr. L. W. Nethercott.

Mar. 19 "Care and Maintenance of Engines," Mr. Kier Smith.

## PUBLICATIONS RECEIVED

**A Radiobeacon and Receiving System for Blind Landing of Aircraft.** By H. Diamond and F. W. Dunmore. U.S. Department of Commerce, Bureau of Standards Research Paper 238. Superintendent of Documents, Washington, D.C., U.S.A. Price 25 cents.

**Sailplaning.** Soaring Flight Co., 16, Hunter Avenue, Clarendon, Virginia, U.S.A.

**Memorandum on Buying Seasons for some of the Principal Goods Imported into Turkey, Palestine, Syria, Iraq, Persia, and Hejaz and Nejd.** No. C.3443. Jan., 1931. Department of Overseas Trade, 35, Old Queen Street, Westminster, S.W.1

**U.S. National Advisory Committee for Aeronautics Reports.**

No. 351. **Full Scale Wind Tunnel Tests of a Propeller with the Diameter Changed by Cutting off the Blade Tips.** By D. H. Wood. Price 15 cents. No. 352. **Large-scale Aerodynamic Characteristics of Airfoils as Tested in the Variable Density Wind Tunnel.** By E. N. Jacobs and R. F. Anderson. Price 20 cents. No. 354. **Aircraft Woods: Their Properties, Selection, and Characteristics.** By L. J. Markwardt. Price 20 cents. No. 355. **Comparative Flight Performance with an N.A.C.A. Roots Supercharger and a Turbocentrifugal Supercharger.** By O. W. Schey and A. W. Young. Price 10 cents. No. 358. **Temperature Coefficient of the Modulus of Rigidity of Aircraft Instrument Diaphragm and Spring Materials.** By W. G. Brombacher and E. R. Melton. Price 10 cents. No. 359. **An Investigation of the Effectiveness of Ignition Sparks.** By M. F. Peters, W. L. Summerville and M. Davis. Price 10 cents. No. 360. **Pressure Distribution over a Symmetrical Airfoil Section with Trailing Edge Flaps.** By E. N. Jacobs and R. M. Pinkerton. Price 15 cents. No. 361. **Experimental Determination of Jet Boundary Corrections for Airfoil Tests in Four Open Wind Tunnel Jets of Different Shapes.** By M. Knight and T. A. Harris. Price 20 cents. No. 363. **Pressure Fluctuations in a Common Rail Fuel Injection System.** By A. M. Rothrock. Price 10 cents. Superintendent of Documents, Washington, D.C., U.S.A.

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### NEW COMPANIES REGISTERED

**CLEWER AERO CLUB COMPANY LTD.,** 150, Southampton Row, W.C.1. Capital £100 in 2s. shares. Objects:—To carry on the business of a club with a view to assisting in the development of civil aviation, etc. The subscribers are:—H. Marshall, 33, Harrington Square, N.W.1, land owner. W. E. Fry, 208, Windsor House, 46, Victoria Street, S.W.1, merchant. M. Gwynne Lloyd, Keppelstone, Forlease Road, Maidenhead, major (retired). Secretary: K. W. Fiddian.

**W. E. PILLEY & CO., LTD.** Capital £500 in £1 shares. Objects: Acquiring business of a motor and aeroplane spare part dealer and factor lately carried on by W. E. Pilley, at 7, Gothic Arcade, Snow Hill, Birmingham. Directors: W. E. Pilley, "Wilkvermore," Dorridge, Warwickshire. G. L. Horton, 7, Crosbie Road, Harborne, Birmingham.

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### AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

#### APPLIED FOR IN 1929

Published, February 12, 1931.

- 31,168. H. WHITBY. Radiators. (341,421).  
31,428. BLACKBURN AEROPLANE & MOTOR CO., LTD., N. W. G. BLACKBURN and T. BANCROFT. Tail-trolley for aircraft. (341,517).  
32,832. ANCIENS ETABS. BARBIER, BENARD, ET TURENNE SOC. ANON. Guiding searchlight for signalling aerial routes. (341,577).  
33,966. A. HALL-BROWN. Propulsion of aircraft. (341,602).

#### APPLIED FOR IN 1930

Published, February 12, 1931.

- 1,965. ECLIPSE AVIATION CORPORATION. Engine-starting apparatus. (341,715).

### FLIGHT, The Aircraft Engineer and Airships.

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

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